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ECONOMICS OF NATURAL GAS DEREGULATION

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CONTENTS

WITNESSES AND STATEMENTS

MONDAY, FEBRUARY 7, 1983

	Page
Jepsen, Hon. Roger W., chairman of the Joint Economic Committee: Opening statement	1
Means, Robert C., Director, Office of Regulatory Analysis, Federal Energy Regulatory Commission	3
Bush, Nicholas J., president, Natural Gas Supply Association (NGSA), Davenport, Iowa	21
McGrath, Jerome J., president, Interstate Natural Gas Association of America (INGAA)	75
Hansen, Christine A., commissioner, Iowa State Commerce Commission, Davenport, Iowa	101
Kleckner, Dean, on behalf of the Iowa Farm Bureau Federation, Davenport, Iowa	153
Daniel, John, vice president-operation, Iowa-Illinois Gas & Electric Co	164
Blanchard, Linda, president, Iowa Citizens for Community Improvement, Des Moines, Iowa	165
Dunn, Gordon, vice president, Citizens for Community Improvement, Cedar Rapids, Iowa	167
Berka, Constance J., spokesperson, United Neighbors, Inc., Davenport, Iowa	168
Morrow, Opal, member, United Neighbors, Inc., Davenport, Iowa	170

FRIDAY, APRIL 15, 1983

Jepsen, Hon. Roger W., chairman of the Joint Economic Committee: Opening statement	207
Johnson. Hon. Manuel H., Assistant Secretary of the Treasury for Economic Policy	208
MacAvoy, Paul W., Frederick William Beinecke Professor of Economics, Yale University	227
Twilley, Joshua M., member, National Association of Regulatory Utility Commissioners	243
Cooper, Mark, director of research, Consumer Energy Council of America	261

SUBMISSIONS FOR THE RECORD

MONDAY, FEBRUARY 7, 1983

Bush, Nicholas J.: Prepared statement, together with attachments	25
Hansen, Christine A.: Prepared statement, together with appendixes, a report, exhibits, and an attachment	104
Kleckner, Dean: Prepared statement on behalf of the Iowa Farm Bureau Federation	157
McGrath, Jerome J.: Prepared statement	78
Means, Robert C.: Prepared statement, together with an appendix	6
Process Gas Consumers Group, the: Statement of	176

FRIDAY, APRIL 15, 1983

Page

Adelman, M. A., department of economics and energy laboratory, Massachusetts Institute of Technology, Cambridge, Mass.: Paper entitled "Natural Gas Policy: International Aspects" 480

American Farm Bureau Federation, Washington, D.C.: Letter to Senator Jepsen regarding natural gas legislation, dated April 15, 1983 486

American Meat Institute, Washington, D.C.: Letter to Senator Jepsen regarding natural gas legislation, dated April 29, 1983, together with an attachment 490

Cooper, Mark: Prepared statement, together with attachments 265

Johnson, Hon. Manuel H.: Prepared statement 213

MacAvoy, Paul W.: Prepared statement 232

Twilley, Joshua M.: Prepared statement 246

ECONOMICS OF NATURAL GAS DEREGULATION

MONDAY, FEBRUARY 7, 1983

Congress of the United States,
Joint Economic Committee,
Washington, D.C.

The committee met, pursuant to notice, at 9:30 a.m., at the New Federal Court Room, Iowa Federal Bldg., Davenport, Iowa, Hon. Roger W. Jepsen (chairman of the committee) presiding.

Present: Senator Jepsen.

Also present: John Conrad, legislative assistant, Senator Jepsen's staff; and Chris Frenze, professional staff member.

OPENING STATEMENT OF SENATOR JEPSEN, CHAIRMAN

Senator Jepsen. I would like to welcome the witnesses here this morning testifying on the state of the natural gas prices and markets. This country and this State are facing a crisis. The rapid escalation of natural gas prices over the last few years has imposed a terrible hardship on the people in their homes and in their businesses. In some cases, people have been faced with the choice of food or fuel. The recent survey that was made by an association in the Linn County-Cedar Rapids area showed that, in fact, of some 20 choices, the reduction of food and groceries in order to pay the fuel bills was always one of the top three most often cited concerns of the people involved.

The pricing problem is a very grave concern of not only the people of Iowa, but people throughout this country. We've been blessed with a mild winter which we have enjoyed prior to this latest snowstorm and the cold of today. But it has not in any way diminished the concern that people have over the mounting and increased prices of natural gas and the proposed and projected increases to come.

It's my conviction that quick action by Congress is necessary to resolve this crisis. In the last session of Congress I introduced legislation to broaden the abuse standard in gas-marketing contracts. I have again introduced similar legislation, and I urge Congress to speedily enact it. I look to the grassroots for support for legislation to cope with the natural gas pricing problem.

You know, the worst thing we can do, as some have called for, is to freeze prices at the current record-high levels. That is a simplistic request, and when you analyze it, it really doesn't make much sense. The unconscionable and disastrous level of gas prices today must not be frozen into law. The objective should be to lower gas prices in order to let the consumers keep more of their hard-earned dollars. With the decline in oil prices, natural gas prices must be permitted to drop to a market-clearing level. Something is clearly wrong when gas prices skyrocket as excess supplies increase. In this hearing we will explore the reasons for this tragic and illogical situation.

At present, the cost of very high priced foreign gas can legally be passed through to the consumers. Long-term contracts obligate pipelines to pay for certain amounts of this and other expensive gas whether they take it or not. Obviously, more flexibility in this market is needed to allow adjustments to changing demand and supply conditions.

We are here today to hear from those directly affected by this problem, the business and the home users. We look forward to hearing their concerns and their ideas on how to solve this problem.

We have perhaps for the first time in discussing this issue in the country put together here today representatives from every area that is of concern in this problem of natural gas pricing. We have representatives here today from Government regulatory agencies, on both the Federal and the State level. Robert Means is from the Federal Energy Regulatory Commission in Washington, and Christine Hansen is representing the Iowa Commerce Commission in Iowa. We have representatives from the producers, Nicholas Bush, from the Natural Gas Supply Association. We have representatives of the pipeline and the distributor folks with Jerome McGrath of the Interstate Natural Gas Association of America. We have a representative of Iowa agriculture here from the Farm Bureau Federation, Dean Kleckner—Iowa agriculture being one of the major users of natural gas in the State. We have a representative of the distribution companies, and that's John Daniel from Iowa-Illinois Gas and Electric. And then we have several representatives of the residential consumers including Linda Blanchard from Cedar Rapids, representing the Citizens for Community Improvement, and Constance Berka from the United Neighbors here in Davenport. Ms. Morrow is also here from Davenport, and I understand we have an additional witness, Gordon Dunn, with Ms. Blanchard from Cedar Rapids.

Now, I would point out that, if one wanted to really pick the specks out of the pepper, one could say, well, you have everybody represented except industrial users, and to a degree, that's true, we don't have someone specifically represented from the manufacturing industry, but I can assure you that these people that we do have here will reflect many of the concerns that industry may have with this problem.

At this time I would announce that at this hearing we will gather facts and information, and we hope bring the white light of publicity to focus on this problem. At the risk of using a pun, we have had some instances in the past where we have generated more heat than light on this situation. This hearing today will be a factual gathering, an exchange of ideas, focused so that those of us in Congress can move with dispatch, can move on an informed basis. Frankly, by having a hearing at the grassroots levels here where it's all happening, I hope that the attention will prompt citizens to report to their individual representatives, and our report will be able to be distributed to those working on this problem in Washington and in the Congress. This will make for legislation that, when it is passed and acted on, will provide a true resolution of this problem, and not just some bandaid approach that may last just a few months, or some sort of a mask to cover up the real problem.

I now ask that we divide this hearing into two panels. The first panel will include Robert C. Means of the Federal Energy Regulatory Commission from Washington, D.C.; Nicholas Bush of the Natural Gas Supply Association; and Jerome McGrath of the International Gas Association of America. If those gentlemen would please come and take their seats.

While the electronic media are setting up the tools of their trade, I would point out again that this panel includes representatives of the Federal Energy Regulatory Commission, the gas producers, and the gas pipelines. There has not been any established order of procedure here, and if I may, I would suggest that we hear first from Mr. Means of the Federal Energy Regulatory Commission, better known in the jargon of the bureaucracy and the Government as FERC. So, Mr. Means, you may proceed.

STATEMENT OF ROBERT C. MEANS, DIRECTOR, OFFICE OF REGULATORY ANALYSIS, FEDERAL ENERGY REGULATORY COMMISSION

Mr. Means. Thank you, Mr. Chairman. I'm very pleased to be here this morning. I've submitted a prepared statement, and with your permission I would like simply to summarize the basic points in it.

Senator Jepsen. Let the record show that the prepared statement submitted by Robert Means will be entered into the record as if read. You then may proceed in any way you so desire, and the Chair would appreciate it if, in the interest of time and the desire that everyone does have an opportunity to be heard, that you do indeed summarize and proceed to consolidate your prepared statement.

Mr. Means. Thank you, Mr. Chairman. If this hearing had been held a year ago, the gist of my testimony would have been that natural gas was underpriced; that although it would cause short-term dislocation, it would have been preferable to deregulate natural gas, to promote conservation and to ease the transition to a deregulated market. The market conditions have changed markedly over the past year, however. The points that I make today are quite different. The price of natural gas is now too high. Not too high simply in reference to some standard of fairness, but too high in comparison with the price that would prevail in a rational deregulated market. This is true already on a number of pipeline systems. Unless the rules that govern the pricing of natural gas are changed, it would be true on most pipeline systems within a relatively short time.

The problem is not principally the high cost of deregulated gas, the high cost of imported gas, although these aggravate the problem. The problem has come to be the price that pipelines are paying for their basic supply of regulated gas. The problem arises from two sources. The Natural Gas Policy Act of 1978 established price ceilings that increase as a result of inflation automatically without action from this Commission or any other body. Second, virtually all natural gas is governed by contracts that guarantees the producer that maximum lawful price. Together, the statute and the contracts have begun to carry the price of natural gas above the market-clearing level as reflected in the current surpluses to which you refer. There is in this combination of rules, statutory and contractual, no provision for response to market conditions. It is an automatic escalator that has been running now for several years without reference to market conditions. Unless changed, it will continue to run without reference to market conditions. Gas will become increasingly overpriced, surpluses will continue to grow and, if as many expect, world oil prices decline, the problem will simply become that much the greater.

In brief, the general nature of what is required is easy to describe. Natural gas producers cannot continue to receive the maximum lawful prices specified by the Natural Gas Policy Act. The difficulty is in describing the path to that goal. The first point I would like to emphasize is that the Federal Energy Regulatory Commission does not have the statutory power to achieve that goal. The Natural Gas Policy Act of 1978 has restricted our effective legal powers largely due to the regulation of interstate pipelines.

There are only two respects in which we have jurisdiction over the price charged to the pipelines by producers. One is in setting incentive prices, which we have done primarily for what is called tight sands gas. The other is in establishing new, just, and reasonable rates for old flowing gas. The Commission staff is already actively considering reducing the incentive price that we have established for tight sands gas, but that gas comprises only about 2 percent of the total supply. Reducing that ceiling price, that incentive price, in my measure is a useful step, but its impact on consumers will be very small.

The Natural Gas Policy Act, on the other hand, forbids us to reduce the just and reasonable price for old flowing gas. Our only discretionary authority under the statute is to increase that ceiling. We have no authority whatsoever to reduce it. A reduction in the ceiling price for category of gas, tight sands, that amounts to perhaps 2 percent of the total, then would exhaust our direct statutory authority to deal with wellhead price.

We are seeking indirectly to increase wellhead price by placing greater risks of marketability on the interstate pipelines. We believe that that kind of a shift of risk is a necessary step in moving toward rational natural gas markets, but the limits on that administrative strategy have to be recognized. The interstate pipelines simply do not have the assets. They do not have the income to absorb large purchased gas costs without passing them on to consumers. Totally eliminating the profits of the interstate pipelines would buy us only some months of relief from the increase in price of natural gas to consumers. The strategy of shifting risks to the interstate pipelines will have an effect on consumers if and only if they in turn are able to reduce the price that they pay to natural gas producers. To some degree they can do this unilaterally through invoking what are known as market-out clauses, and most of the interstate pipelines have now taken that step, but those clauses cover only a small part of the total supply.

To reduce the price on the larger part of their gas supply, they will have to renegotiate their contracts with producers. And one of the most deeply disturbing features of the current situation is, up to this time, there has been no significant successful renegotiation of price terms. Renegotiation of take-or-pay terms there has been, but of price terms there has not. If this continues to be the case, then, of necessity, the responsibility will have to pass to the Congress because it is the only remaining form with the authority to revise the terms of those contracts.

Legislation on natural gas may deal with a number of problems, take or pay, our authority over pipelines, perhaps increased competition in burner-tip markets, but the central concern has to be, I think, the price that is paid to producers for the natural gas. There must be in one way or another a revision of the contracts that guarantee producers the maximum lawful price established by the Natural Gas Policy Act.

Mr. Chairman, thank you.

[The prepared statement of Mr. Means, together with an appendix, follows:]

PREPARED STATEMENT OF ROBERT C. MEANS

Chairman Jepsen, my name is Robert C. Means. I am the Director of the Office of Regulatory Analysis at the Federal Energy Regulatory Commission. I am pleased to appear before you today to discuss the current natural gas situation.

Because of its legislative mandate and administrative responsibilities, the Federal Energy Regulatory Commission is necessarily concerned about the recent increases in the price of gas to consumers. This trend is especially problematic because it has continued in the face of a national surplus in natural gas deliverability. Rising prices in a time of surplus strongly suggest that there are fundamental defects in the way by which natural gas prices are established. The Commission has been attemping to identify these defects and, within the terms of its authority, it has been exploring the means available to it for correcting them. One reason that I welcome the opportunity to discuss these issues is that this authority is inadequate for this purpose.

Let me begin by describing the reasons for the present round of price increases, and their policy implications. I shall then turn to the Commission's effort to respond to the problem, and to potential legislative solutions.

The increases in natural gas prices over the past four years are the result of the interaction of two sets of legal rules: one contained in the Natural Gas Policy Act of 1978, and the other contained in the contracts between natural gas producers and pipelines. The Natural Gas Policy Act [NGPA] divides natural gas into a number of different categories. One category of natural gas, comprising about 5 per cent of the total supply, is now deregulated, and its price is determined solely by contract. For the other categories, the NGPA establishes price ceilings. These ceilings increase automatically at least at the rate of inflation, and for some categories of gas the NGPA provides for a rate of increase faster than the rate of inflation. In addition, the relative importance of the different categories of gas is changing with time. In order to focus incentives where they would be likely to produce the largest supply response, the Congress established higher price ceilings for newer categories of gas and lower ones for gas being produced from existing wells. Inevitably, the relative importance of the newer categories of gas increases with time, while the supply of gas from the older wells is gradually exhausted. As a result, the mixture of gas in the total supply is gradually shifting towards the higher-priced categories.

The NGPA establishes only price ceilings. Pipelines and producers are legally free to establish any price they choose so long as it does not exceed the ceiling. In practice, however, virtually all natural gas is governed by contracts that guarantee the producer the maximum lawful price allowed by the NGPA. The practical effect of the NGPA therefore is to establish not just ceilings but the price that pipelines actually pay producers for their gas.

As a result of the escalation terms built into the NGPA and the increasing importance of the higher-cost categories of gas, the average cost of gas to pipelines has been increasing much faster than the rate of inflation. Over the past several years, the rate of increase has averaged around 20 per cent per year. The forces behind this increase have virtually nothing to do with market conditions; the price of the small amount of deregulated gas has tended to respond to changes in supply and demand, but the price of most gas increases at a rate that is determined almost solely by the rate of inflation and the changing importance of the individual categories of gas. The price increase thus continues at approximately the same rate in time of surplus as in time of shortage. When the Iranian crisis resulted in a large increase in the price of oil, and thus also in the price of the alternative fuels with which natural gas competes, the rise in natural gas prices did not accelerate appreciably. Now today, when there is a large surplus of natural gas, the rise in natural gas prices has not slowed.

As a result, the price of natural gas is now above the market-clearing level on a number of pipeline systems. The imbalance between supply and demand is likely to grow worse over the next year. Economic recovery should increase demand for natural gas, but its effect is likely to be more than offset by that of still higher gas prices and a decline in world oil prices. Natural gas prices are now too high, not just in comparison with some standard of fairness but in comparison with the price that would prevail in a rational unregulated market.

Our goal should be natural gas prices that can fall as well as rise; prices that can respond flexibily both to periods of surplus and to periods of shortage. For this goal, the contracts governing gas purchases will not do. They simply are not adequately responsive to market forces. They can lead to excessively high prices even in strong natural gas markets, and they are incapable of reducing prices in weak ones. They must be reformed.

The Commission lacks the power to require this reformation. Before enactment of the NGPA, the Commission had broad authority over wellhead prices, but under the NGPA we have become again principally a regulator of pipelines. The cost of the pipelines themselves have been increasing rapidly, and Commission staff is actively studying the reasons for this increase. But the principal reason for the increase in consumer gas prices is the increase in the price paid by pipelines to producers. The NGPA has left us discretionary authority to change this wellhead price in only two areas. We have the power to set incentive prices under Sections 107(c)(5); and we have the power to set new just and reasonable prices under Sections 104, 106, and 109. Commission staff is now studying a proposal to reduce the incentive prices that we have established under Section 107, but the volume of gas governed by those incentive prices amounts to only about 2 per cent of the total supply. We cannot take any comparable action with respect to the much larger volume of gas governed by Sections 104, 106, or 109, because those sections explicitly limit us to raising the established maximum lawful price. A reduction in the incentive price established under Section 107 thus would exhaust our direct authority to lower wellhead prices, and such a reduction would have only a very small effect on consumer gas prices.

If we are to have a broader effect on wellhead prices, it must be indirectly, through our regulation of pipelines. The Commission has been seeking to place more of the risk of marketing gas on the pipelines, rather than on the distribution companies that sell to the end user. In an appendix to this testimony I have briefly described a number of Commission actions of this kind. It should be emphasized, however, that there are practical limits on the extent to which pipelines can be required to absorb gas costs without being able to pass them on to their customers. Commission actions placing more risk on the pipelines can only have a significant impact on consumers' gas prices if the pipelines can respond to these actions by reducing the price that they pay to producers. Pipelines can in some cases do this by invoking market-out clauses, that is, contract clauses that allow them unilaterally to reduce the price of the gas if they are unable to resell it at the prevailing price. But such clauses are not included in most gas purchase contracts, and where they are not, the pipeline's only alternative is to renegotiate its contracts with producers. Renegotiation requires the cooperation of both parties to the contract, however. I am deeply concerned that pipelines appear so far to have been unable to obtain price concessions from natural gas producers. There has been some successful renegotiation of take-or-pay obligations, but as yet there appears to have been no significant renegotiation of prices.

I hope that renegotiation succeeds. If it does not, the responsibility necessarily passes to the Congress. In general terms, I believe that view that natural gas legislation should both remove the statutory price ceilings that keep the price of some gas below the market-clearing level and modify the operation of the natural gas contracts to make them more responsive to changes in supply and demand. The first change is relatively straightforward, although there clearly is room for legitimate debate concerning the time over which the price ceilings should be eliminated. The second change is much more complex. There is no entirely satisfactory way of achieving flexible prices through legislation. Legislation imposes a single solution on thousands of different contracts and economic relationships, and inevitably the legislative solution will be unfair or inappropriate in some cases. If pipelines and producers are unable to renegotiate their contracts, however, legislation is preferable to a continued senseless rise in natural gas prices in the face of large surpluses.

There appear to be two general ways to achieve more market-responsive prices through legislation. One is to give pipelines a broad market-out clause in all of their gas purchase contracts. Such a clause would enable pipelines unilaterally to bring the price of their gas down to the market-clearing level, and indeed perhaps the greatest potential shortcoming of such clauses is that they may offer little protection to producers, especially in a time of surplus supply. To protect producers, the pipelines' right to lower the price therefore should be balanced by an obligation to transport the gas to another purchaser if the producer is unwilling to accept the lower price.

The second alternative is to subordinate indefinite price escalator clauses to a cap designed to approximate the market-clearing price for gas. The evident problem with this alternative is to devise a formula that does respond to natural gas markets conditions. Some have proposed linking the cap to oil prices, for example setting it at some percentage of the price paid for oil by United States refiners; but the competitive relationship between oil and gas prices may now be too uncertain and too volatile for it to provide an adequate basis for legislation. An alternative worth exploring would be to link the cap to the price currently being negotiated by pipelines for new uncommitted supplies of gas.

There are other matters that should or might be dealt with in natural gas legislation. The NGPA's incremental pricing provisions appear to have outlived their usefulness; the same is true of the Fuel Use Act's restrictions on the use of gas. Legislation might also give the Commission broader powers to encourage pipelines to minimize the long-run cost of gas to consumers. Some have suggested that legislation might also attempt to create greater flexibility and competition in burner-tip markets.

These other issues are important. However, they should not be allowed to obscure the central issue of price. The mechanism that determines the price that pipelines pay for gas must be changed, and the change must come either from the cooperative action of pipelines and producers or from the Congress. And if pipelines and producers are unable to renegotiate their contracts, the principal responsibility must rest on the Congress.

APPENDIX

Commission Actions Affecting the Risk of Marketability

The Commission is seeking to provide incentives for the reformation of natural gas purchase contracts. The incentives must be placed on the pipelines. Distributors are not in a position to participate directly in the reformation process; producers fall largely outside the Commission's jurisdiction. The Commission's role thus must be carried out through its regulation of interstate pipelines.

The limits and implication of this role are still being explored. Something of its possibilities may be suggested by a brief examination of some recent actions by the Commission and issues now being presented to it.

A. Rate Design to Discourage Load Loss

One example of the Commission's attempt to give pipelines explicit incentives to insure the marketability of their gas is its decision in Tennessee Gas Pipeline Co., 21 FERC ¶61,004 (Oct. 1, 1982) and several cases which followed that decision's approach. In Tennessee, the Commission granted the pipeline's requested purchased gas adjustment, but noted that pipelines perhaps should be responsible for load loss due to fuel switching induced by high gas costs. The Commission stated that it could, in a section 4 or 5 rate proceeding, consider rate design proposals which would provide incentives to the pipeline to minimize gas costs. For example, the Commission said that rate design might make full recovery of the pipeline's fixed costs contingent on its avoiding or limiting load loss.

B. Discount Rates

The same concern with incentives for retaining load through minimizing gas costs is reflected in the Commission's recent orders allowing three pipelines to charge special discount rates to certain industrial customers (Docket Nos. CP82-542, CP83-14, CP82-485). The discounts were intended to prevent the loss of load to competing fuels. The pipelines proposing them argued that all customers would benefit from the special rates since customers qualifying for the discounts would otherwise leave the system and would no longer make any contribution to fixed costs.

The discount rates raised two policy concerns. The first was that the rates in fact benefit nondiscount customers in the short term. The Commission therefore required that the rates exceed the costs that the pipeline would avoid if it did not make the discount sales. If that standard was not met, the nondiscount customers would be better off if the pipeline lost the load than if it retained it through the discount rate, and the Commission therefore would not approve the special rate. 8/

8/ A pipeline is considered to have two alternatives: it can make the discount sale and receive the discount price; or it can not make the sale and avoid certain costs. The discount rate benefits nondiscount customers in the short term only if it exceeds those avoided costs.

The second concern was that the special discount rates might serve as an alternative to renegotiating gas purchase contracts to reduce gas costs for all customers. A pipeline's avoided gas costs could prove to be quite low. 9/ For example, problems such as drainage might force a pipeline to take gas and store it if it could not make the discount sale; the cost avoided by not making the sale then could be even lower than its average cost of gas. A discount rate in excess of this low avoided cost still might benefit nondiscount customers in the short term, but if it tended to insulate the pipeline from market pressure to renegotiate its contracts, it would not benefit them in the longer term. The Commission therefore imposed a second condition on the proposed discount rates: the discount rate must also exceed the pipeline's weighted average cost of gas.

C. Minimum Bill Cases

The problem of allocating the risk of gas marketability also has been raised in another context. In several cases now

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9/ If a pipeline is attaching new reserves, its avoided cost in general will at least equal the price of the most costly new reserves that it is currently attaching, but pipelines that seek special discount rates may also have temporarily suspended the attachment of new reserves. If so, their avoided gas costs would be the amount that they would save by reducing sales from existing reserves. As a result of take-or-pay obligations or, as in the example in the text, an essentially absolute obligation to take the gas, the avoided gas costs may be less than the wellhead price of the gas.

before the Commission (United Gas Pipeline, Docket Nos. RP82-16 and RP81-81, Panhandle Pipeline RP82-105 and RP82-88, Trunkline Gas Corp., Docket No. RP81-103, Columbia Gas Transmission, RP83-8), distribution companies and, in at least one case, Commission staff, have challenged the "minimum bill" obligation which pipelines have included or are seeking to include in their tariffs. A minimum bill requirement is like a take-or-pay obligation; under both the purchaser must pay for gas whether it is taken or not. Where the contract is between producer and pipeline, the obligation is generally referred to as a take-or-pay obligation; where it is between pipelines or between a pipeline and a distributor it is generally referred to as a minimum bill obligation. Unlike take-or-pay, minimum bill payments typically are not credited toward future purchases.

In the United case, the primary issue is simply whether its proposed level of minimum bill (two-thirds of maximum contract quantities) is just and reasonable. The company has taken the position that the minimum bill is necessary to cover take-or-pay obligations to suppliers and to avoid load loss. FERC staff has taken the position that, at the very least, the level of the minimum bill has to be based on the pipeline's fixed costs. Staff has not yet addressed the question whether take-or-pay obligations should be treated as fixed costs for this purpose.

The other three cases involve challenges to existing minimum bills. In the Panhandle and Trunkline cases, the customers challenging the minimum bill have raised an antitrust issue in addition to the general just and reasonable issue. Partial requirements customers in these cases argue that the minimum bill, which applies only to the partial requirements rate schedule, has been established at a level which is intended to discourage customers from seeking alternative gas suppliers. They argue that the minimum bill, in combination with the rate structure, essentially forces them to become full requirements customers.

The Columbia matter grows out of that company's attempt to abrogate its existing minimum bill with its pipeline suppliers. The suppliers petitioned the Commission for enforcement of the tariff and Panhandle sued in state court in Ohio for damages. Columbia's defense is based on the theory that the economic recession now plaguing the nation and, in particular, its service area, amounts to a force majeure.

D. Direct Challenges to Pipelines' Purchasing Practices

Finally, there are several Commission proceedings in which pipeline purchases themselves are being directly scrutinized under sections 4 and 5 of the NGA and under section 601(c) of the NGPA.

The leading Commission opinion in point is Tennessee Gas Pipeline Co., referred to above. In that case the Commission indicated that the payment of imprudent prices for gas was not within the "fraud, abuse, and similar practices" standard for denying passthrough under section 601(c) of the NGPA. The Commission did hold, however, that the prudence of a pipeline's purchase practices could be challenged under sections 4 and 5 of the NGA, i.e., in a general rate proceeding. This matter is now in hearings, as are other proceedings involving similar issues.

Taken as a whole, the Tennessee decision thus largely closed one door and opened another. It largely foreclosed Commission review of individual gas purchase contracts for prudence. This rejection of a contract-by-contract consideration of purchased gas costs rested in part on a legal interpretation of NGPA section 601(c) and in part on the administrative impracticability of a broad application of the contract-by-contract approach. But at the same time, as noted above, Tennessee also strongly suggested that the Commission would consider the creation of general incentives directed at the same end of minimizing gas costs. The Tennessee case is now in hearings, as are other cases raising the same issues.

Columbia Gas Transmission, Docket Nos. TA81-1-21, TA81-2-21 (Initial Decision, December 30, 1982) is the only administrative decision since Tennessee Gas Pipeline which deals with the propriety of purchase gas costs under either NGPA section 601(c) or NGA sections 4 and 5. In that decision, which still is subject to Commission review, Administrative Law Judge Levant denied passthrough of gas costs in PGA rates to the extent they "exceeded the costs Columbia would have incurred if it had made cutbacks in order of cost." Further, under section 5 of the NGPA, Judge Levant ordered Columbia to desist from various purchasing practices which affected Columbia's rates, including _inter alia_ "engaging in gas acquisition practices which fail to take consideration of the marketability of its gas in the markets of all its customers."

The ultimate disposition of the _Columbia Gas_ case is unknown at this time. It may be worth noting, however, that Judge Levant's decision marks an intermediate course between the case-by-case approach rejected in _Tennessee_ and the general incentive approach supported there. _Columbia Gas_ deals directly with the passthrough of purchased gas costs, but its refusal to allow passthrough in some instances is based principally on the pipeline's general purchasing practices and not on the prudence of individual contracts.

Senator **Jepsen**. Thank you. Rather than going directly to questions, I think I would ask that each one of the panel members make their initial opening statement. Again, at a hearing it's almost impossible to keep to the 10-minute parameter that we have, so I would like to summarize what I think I heard you say, and that is that the Federal Energy Regulatory Commission has very little authority by statute to address the problems that we've been experiencing. The statute, or the Natural Gas Policy Act of 1978, was generated by the fact that at that time it was felt that we were going to have a continued shortage of natural gas in this country.

However, the combination of finding new sources of natural gas and the conservation, on the other hand, brought us to this point today where we now have a 1978 act that in some ways did a good job, but in other ways presented problems. The Natural Gas Policy Act of 1978 does not seem to permit the entire industry, distribution, production, so on, to adjust to changing market conditions. Now we've got to see how true or rigid that statement is, which is one of the things we hope to unravel here this morning.

Shall we start with the people who produce it? That's where the gas comes from. Right out of the ground, so Mr. Bush, representing the Natural Gas Supply Association, you may proceed.

STATEMENT OF NICHOLAS J. BUSH, PRESIDENT, NATURAL GAS SUPPLY ASSOCIATION (NGSA), DAVENPORT, IOWA

Mr. **Bush**. Good morning, Senator. My name is Nicholas J. Bush, and I am president of the Natural Gas Supply Association, an organization of producers who market about 90 percent of the Nation's natural gas. We have large, integrated companies as members.

Senator **Jepsen**. May I interrupt you? In the interest of getting your remarks all on the record, and because of the location of the microphones, would you please change places?

Mr. **Bush**. Oh, sure.

Senator **Jepsen**. We want to make sure we have a complete record so when we get done we have the knee bone connected to the thigh bone and the thigh bone connected to the hip bone, and we indeed get a complete picture of this issue.

Mr. **Bush**. Senator, as I was about to say, our organization represents large integrated gas companies as well as small independent producers. Rather than read my full testimony, I also would ask you, Mr. Chairman, if it could be submitted in its entirety for the record, and I will summarize my remarks.

Senator **Jepsen**. The record will show that the prepared statement of Nicholas J. Bush will be printed in the record as if read, and you may now proceed in any manner you so desire.

Mr. **Bush**. Senator, I want to first associate myself with your opening remarks. I think they represent a very candid and very correct assessment of the current situation.

Last week, Mr. Chairman, CBS News did a short piece on the evening news about the anger felt by Iowans about rising natural gas prices. Rising prices, which once again Dan Rather, smiling into the camera, said had begun with the beginning of decontrol in 1978. The CBS reporter that was covering it here locally in Iowa felt compelled, I thought, to slip back into the debilitating commentary of the 1970's and charged that consumers angry over these higher prices were targeting their rage at big oil and gas. I hope, Mr. Chairman, that many consumers this time won't be falling for the media hype that occurred in the 1970's, and the charges by those who would like to turn the argument into some form of class war.

I believe that there is a chance that that may occur, because I think we can best illustrate it by taking a look at two headlines, and I brought these along for issue sake. One, the headline in the Washington Post that says: "Natural Gas Surpluses Lead to 20 Percent Price Rise," and another one, a recent one in USA Today similar to many running around the country these days: "United States Gasoline Prices Promise Some Break on Dollar Market." There is only one difference, one significant difference. Both of these are energy commodities where there is less demand and more supplies. Natural gas is price controlled, oil is decontrolled. And as a result, oil reflects the price that a consumer is willing to pay for it. That's the one significant difference, Senator, between those two commodities.

Now, the same people, Mr. Chairman, many of the same groups who are now predicting disaster with natural gas decontrol are the same ones who told us that oil decontrol would result in $100 a barrel oil and $5 prices at the pump. They were wrong then and they are wrong now. The only way a product can experience the kind of a situation we have with natural gas when there is more than enough available supply for delivery and purchase and the prices keeps going up is when it's a regulated commodity. Mr. Chairman, if there was one myth that I could dispel before leaving this hearing room this morning it would be that rising natural gas prices are the result of a decision to decontrol. That's just pure and outright baloney.

The Natural Gas Policy Act in 1978 extended controls into markets that were formerly competitive and free. It set up more than 28 pricing categories for natural gas that is otherwise indistinguishable in other aspects, and on January 1, 1985, it does not, as many people still erroneously believe, decontrol all natural gas; rather it decontrols perhaps what will then be 40 to 50 percent of the gas flowing and keeps the remainder forever regulated.

What has resulted from the Natural Gas Policy Act is a crazy quilt of distortions and inequities that falls the heaviest on the consumer. By immediately decontrolling that natural gas which is discovered in reservoirs falling below 15,000 feet, so-called deep gas, the law irrationally placed the greatest incentive for producers to explore for and develop the most difficult and most expensive gas first. It's not altogether unlike telling a farmer to hire a helicopter and start picking his apples from the top of the tree.

While this gas is only 4 or 5 percent of the total now produced, it represents a disproportionate share of the cost of many of the pipeline systems. The reason for this is because a Natural Gas Policy Act maintains most domestic gas under tight controls, encouraging the purchase of new supplies by pipelines at prices higher than what the market would otherwise bear. To the extent that a pipeline has a large inventory of low-priced, forever-regulated gas, it can then buy uneconomic, high-cost supplies such as deep gas, LNG, liquified natural gas, the famous trunkline synthetic gas, imported gas, rolling in these high-cost gas supplies with low-cost regulated supplies. As a result, pipelines have paid up to $10 for some deep gas, $7.16 for Algerian gas without any associated transportation costs on the land, $5.01 for Mexican gas, and currently $4.94 for Canadian gas, while the domestic price for natural gas on the average in September was $2.53.

A matter of particular concern to Iowans and the Midwest in general, we believe, is the increasing number and amount of imports of Canadian gas into this region. Despite a decline in the first three quarters of 1982 of 27 percent in domestic gas consumption here, Canadian gas imports actually increased. It may interest you that in the Midwestern region there were 140 billion cubic feet of gas from Canada in 1941, and it's projected by the American Gas Association that it will be 252 billion cubic feet in 1983.

I think, Mr. Chairman, in relationship to that Canadian gas, if I can just say a couple things. Northern Gas Co., which is the major pipeline supplier in Iowa—provides over a third of the State's natural gas requirements—is particularly going to be experiencing rising gas costs attributable in a large degree to its Canadian gas purchases, and you will note some variation of this in the attachments to my testimony. In purchased gas adjustments filed over a 12-month period, December 31, 1981, to December 31, 1982, Northern Natural showed a planned increase of 64 percent for their Canadian gas costs. The latest PGA filing for prospective gas costs indicates that Canadian gas will account for over 30 percent of Northern's total gas costs. If one adds projects now pending approval, Iowa may be importing up to 100 percent more Canadian gas by the end of 1984 than in 1981.

Consumers have every right to question the wisdom of trading off relatively cheaper domestic gas for higher priced imports, and, Senator, we would just call that to your attention.

There is quite a bit else in my testimony, Senator, that I think will be of interest to you, and the Iowans, and to Midwesterners, but I will at this point try to break off. Let me just say that I would welcome an opportunity in the question-and-answer period on what we could do to solve the problem. It rests in the belief that the consumer ought to be determining what the price of natural gas is, not a regulatory body, and we are willing very specifically to address the contract issues.

Producers have been speaking for over a year and a half about how those questions can be addressed with equity and concern for everyone, and let me finally close by saying that there is some misunderstanding that producers are not concerned with consumers' ability to pay for gas bills. That, I would also say, is pure nonsense. The reason that a producer and a producer representative can sit here and talk to you about wanting to stabilize long-term prices instead of portraying themselves as wanting higher and higher prices is that we make money based on being able to sell gas, and it does not help us when industrial consumption in this area falls 40 percent and we can't sell gas. It doesn't help us when Ms. Morrow or anyone else in this room can't afford to. We sell it and we want very much for those people to have the best possible price. But if they don't, they will go and find an alternative source of supply, so we are very much afraid of the fact that low-income and elderly and people on fixed incomes may very well find alternatives.

So this is not the time to cut low energy assistance to people for energy needs. We don't know what the right level is, but there has been some suggestion within the administration that this may be the time to cut that assistance. We don't think that's appropriate, nor is it timely to do so. Thank you.

[The prepared statement of Mr. Bush, together with attachments, follows:]

PREPARED STATEMENT OF NICHOLAS J. BUSH

My name is Nicholas J. Bush. I am President of the Natural Gas Supply Association (NGSA), an organization of producers who market about 90 percent of the nation's natural gas.

The Association thanks the Chairman and his staff for affording us the opportunity to participate in today's hearings, which will explore the state of current gas markets, the operation of the Natural Gas Policy Act (NGPA), the effect of certain gas contract provisions, and the gas price and supply outlook under several policy options. We are especially pleased to discuss these matters with you in Iowa, where we know the subject of current gas policy has been a focus of special emphasis and concern.

NGSA Position

To begin, the NGSA advocates deregulation of all natural gas prices at the wellhead by a date certain, not later than the January 1, 1985 date for partial deregulation contained in the Natural Gas Policy Act. We believe that a free natural gas wellhead market will most efficiently match future gas supplies with demand at reasonable prices to consumers. A comprehensive solution will doubtless address other aspects of the gas issue, but total wellhead price deregulation must be achieved at the earliest possible date to prevent regulation-induced distortions, which adversely affect both consumers and producers of natural gas.

Current Gas Policy

Since 1978 natural gas pricing policy has been set by the Natural Gas Policy Act, part of the Carter Administration's National Energy Act. NGPA provides for the deregulation of roughly 50% of the nation's natural gas supply on January 1, 1985, continues forever price controls on "old" natural gas previously regulated under the Natural Gas Act, and allows incentive pricing treatment for certain high-cost natural gas supplies, subject to Federal Energy Regulatory Commission (FERC) discretion. NGPA contains more than 28 pricing categories for natural gas otherwise indistinguishable in quality or any other aspect. Supporters of NGPA believed that, in spite of its obvious complexity, such a "fine-tuning" of gas prices could stimulate new gas supplies at less cost than a market-based pricing system.

Experience under NGPA demonstrates that it is not working. Pricing significant quantities of old natural gas below market has discouraged further investment from previously-discovered reservoirs, from which more gas would be produced at relatively reasonable costs to consumers. Equally important, below market pricing of old gas has encouraged the purchase of additional supplies of natural gas at above market-clearing levels.

NGPA Encourages the Purchase of Expensive Gas

Regulation of the domestic natural gas market creates irrational economic incentives. Pricing significant quantities of natural gas below market encourages the purchase of new supplies at prices higher than market clearing levels. To the extent that a pipeline has a large inventory of low priced regulated gas (e.g., a large gas cushion), a pipeline can purchase uneconomic high cost supply increments such as LNG, synthetic gas, imported gas and high-priced decontrolled gas because price regulation under the NGPA affords an incentive to roll-in high cost gas supplies with low cost regulated supplies. Even in a widely recognized atmosphere of excess gas deliverability, and the availability of lower cost domestic supplies, some pipelines with a large cushion continue to purchase above market foreign gas reflecting the fact that the NGPA continues to provide such pipelines with erroneous signals which distort market realities. Consumers do not benefit when natural gas prices are kept artificially low by the NGPA when the benefit of low regulated prices merely allow a pipeline to roll-in high cost supplies.

Imports Are An Important Example

The fact that pipelines are able to average in high cost gas purchases with the low cost regulated supplies helps explain the continued purchase of imported natural gas at prices twice that of the average domestic wellhead price. In September, 1982 the average domestic price at the wellhead was $2.53 per Mcf. At the same time Canadian gas sold for $4.94/MMBTU at the border, Mexican gas was selling at $5.01/MMBTU at the Mexican border, and Algerian LNG contracts contained a landed purchase price of $7.16 per MMBtu. It is very doubtful that gas would be marketable at these prices in absence of the price "cushion" provided by artificially low price ceilings on old gas prices. Consumers are worse off to the extent that domestic gas might have been produced - and purchased - at prices lower than those for imported gas.

Consumers have every right to question the wisdom of trading-off relatively cheaper domestic gas for higher-priced imports. Further, questions of foreign policy quite often become involved in any discussion of imported gas contract terms, making it difficult to obtain any type of relief. In fact, in mid-winter 1980 the Canadian government exacted a 70% price increase for its gas exports to the United States, at a time when the U.S. supply posture and season made it impossible to resist such a demand. When the U.S. capitulated to the Canadians, the Mexican government informed us that it, too, wanted the same price for its gas exports, in spite of the fact that those contracts had been concluded only shortly before, after years of acrimonious negotiations. The Canadian government's recent refusals to consider any reduction in its established gas price to reflect changed market conditions is just the latest example of the problems which arise when the nation becomes dependent on imported gas supplies.

Impact of Natural Gas Imports from Canada on Iowa and The Midwest

Over the first three quarters of 1982 domestic natural gas consumption in the Midwest has decreased 27%. However, gas imports from Canada have increased, and have now begun to flow through the recently completed pre-build section of the Alaska Natural Gas Transmission system, bringing additional economic pressure on domestic producers and consumers.

Traditional markets for Canadian gas have been in the Northwest. However, increasing amounts of Canadian gas are planned for marketing in the Midwest. According to the American Gas Association, Canadian Gas Import Projects serving the Midwest amounted to 237.5 Bcf in 1981 (see attachment "A").

Currently, significant portions of the Midwest gas market are now being served by Canadian gas.

State	Canadian Gas Imports As a Percent of Total Utility Sales
Iowa	5 - 10%
Illinois	5 - 10%
Minnesota	10 - 25%
Michigan	10 - 25%
Wisconsin	10 - 25%

The increasing volumes of Canadian gas entering the Midwest and Iowa will cause a dramatic rise in imports' share of purchased gas costs to pipelines. Northern Natural Gas Company, the major pipeline supplier in Iowa, providing over a third of the state's natural gas requirements, will experience rising gas costs attributable in large degree to its Canadian gas purchases (see attachments "A" and "B").

In purchased gas adjustments filed over a 12-month period, Northern Natural Gas Company showed a planned increase of 64% for Canadian gas cost. The latest PGA filing (January 1, 1983) for prospective gas costs indicates that Canadian gas will account for over 30% of Northern Natural's total gas costs. If one adds projects now pending approval, Iowa and other Midwestern states may be importing up to 100% more Canadian gas by the end of 1984 than in 1981.

Compared with similar 1981 figures, U.S. gas imports rose 7% in the first three quarters of 1982, according to Energy Information Administration figures, while domestic production of gas declined 7% in the same period. Until all market sectors, both domestic and foreign, are in competition with each other and with alternate fuels, there is no basis and no incentive for Canada to modify its export pricing mechanism. NGPA's subsidy of gas imports makes no economic sense, and it costs American gas consumers considerable money in unnecessary costs.

NGPA Has Failed to Spur Production

The NGPA has also failed to stimulate domestic natural gas production adequate to meet our needs in the years ahead. Over the past decade additions to U.S. reserves show that we have produced from inventory roughly 1.6 times more gas than we have discovered.

Natural gas pipelines and the Federal Energy Regulatory Commission have repeatedly expressed concern over the rapid depletion of long-term gas inventories. Current pricing policy has proved inadequate to guarantee that sufficient domestic gas supplies will be available in this decade and next to meet the needs of a restored and expanding economy.

Much Gas Remains To Be Found

The problem does not lie with the size of the resource base; both the United States Geological Survey (USGS) and the Potential Gas Committee estimate that we have nearly a 50-year supply of conventional gas which can be tapped under appropriate natural gas pricing policy. But NGPA, by continuing low price ceilings on much of our domestic supply, has actually reduced the rate of increase in gas well drilling from 20% immediately before its passage to only 11% in the three years following its enactment. 1981 additions to reserves exceeded gas production only because of revisions and corrections in published estimates for prior years. This statistical correction does not indicate that the long-term downward trend in reserves adds has been reversed.

NGPA Causes Market Disorder

Market-ordering problems also arise from the impact of NGPA upon the historical distribution of low-priced gas among interstate pipelines and between the interstate and intrastate pipeline systems. In fact, the vintage price system established originally by the Federal Power Commission, and vastly expanded by the many NGPA pricing categories, results in favored types of consumers who are subsidized at the expense of other consumer groups; favored pipelines whose weighted average cost of gas is less than half that of other pipelines; and favored producers who receive up to twenty times more for their gas than do other producers. Congress, the Federal Energy Regulatory Commission, and many private groups have studied the various manifestations of this market disorder phenomenon. There is general agreement that market disorder ensures that any domestic benefits of continued gas price regulation will be unevenly distributed among natural gas consumers while, as previously demonstrated, other benefits will be captured by foreign gas producers. In short, NGPA-imposed price controls have greatly complicated our domestic gas markets while gaining little, if anything, for the average consumer.

The Distortions of NGPA and Its Impact on Agriculture

Agricultural production is affected both directly and indirectly by change in natural gas price. It is used as a direct input in farm operations such as irrigation and crop drying and indirectly it is a major input in the production of fertilizers (especially ammonia, an important ingredient in the production of nitrogenous fertilizers).

The distortions previously mentioned between the interstate and intrastate markets will have a severe impact on the agricultural sector.

The continuation of current policy under the NGPA may create a particularly difficult gas-supply situation for the ammonia-producing industry. During the early and middle 1970's, ammonia producers tended to locate on intrastate pipelines (in Texas, Oklahoma and Louisiana) because of greater security of supply. Currently about 55-60 percent of ammonia production capacity uses intrastate gas.

If inventories of natural gas continue to fall, consumption of natural gas will be mainly designated to high-priority residential and commercial use. If non-associated reserve additions (those connected with drilling for gas only) continue to decline along with the rate of increased gas well completions, the likelihood of general shortages is greater for ammonia producers than for other industries due,to their intensive consumption of natural gas in intrastate markets. The Natural Gas Policy Act has turned the advantage most gas consumers in the intrastate market enjoyed into the possibility of those states becoming gas deficient.

The recent trend is illustrated by the 1980 EIA reserve study, which found intrastate market contract commitments only 29 percent of total commitments. Historically, the intrastate market has accounted for about 40 percent of total U.S. natural gas consumption.

Within the ammonia-producing industry, deregulation would be likely to change the relative competitive positions of producers served by intrastate as compared to interstate pipelines. Under current policy, after 1985 the interstate pipelines will have larger amounts of previously contracted, relatively low-price gas, and so will be able to compete aggressively for new gas supplies and roll in higher cost new supplies with low priced "cushion" gas. Thus, the interstate lines could offer both better terms and better guarantees of supplies than the intrastate lines. This would place the ammonia producers on intrastate lines at a competitive disadvantage, thereby negatively affecting regions of the country with large fertilizer needs.

In general most expenditures for natural gas direct farming applications occurs in the West South Central region, primarily in the intrastate gas market. This region of the country, which includes Louisiana, Texas, Oklahoma, and Arkansas, spent approximately $95.1 million dollars for natural gas, 40 percent of total U.S. gas usage, with Texas alone spending $82.3 million for gas. Most of these costs were for fuel used in irrigation, which accounts for 96 percent of the nation's agricultural gas use.

Preliminary findings of a study being conducted for the Natural Gas Supply Association (NGSA) by Dr. Earl O. Heady and Dr. Burton English at the Center for Agricultural and Rural Development in Ames, Iowa, indicates that Iowa farmers reported spending 1% of the nation's gas costs for agriculture. This was primarily spent for crop drying. Therefore, natural gas price increases are not likely to have an impact on Iowa's farm sector. Substitutes for natural gas use in crop drying exist, such as LPG, so Iowa farmers could convert to an alternative fuel for drying if the need arose.

Phased Decontrol Is The Best Solution

The solution to current problems lies in extending the decontrol concept to the pre-1985 period, and including old gas among that which is gradually deregulated. A phased decontrol of all natural gas will eliminate market disorder and other economic distortions caused by the uneven distribution of subsidized old gas supplies.

Phasing-up old gas prices to market levels eliminates the gross disparities in average costs among interstate pipelines and between the interstate and intrastate natural gas transmission systems. As old gas prices increase, pipelines which have gained the advantages of an old gas "cushion" through historical accident will no longer be able to bid above market-clearing prices for new gas supplies (including imports). In this environment any above market-clearing prices actually paid would inhibit a pipeline's ability to compete with alternative fuels. Therefore, phased decontrol will over time eliminate policy-induced distortions in the competition for new gas supplies. It will also provide a smooth transition to the completely deregulated market after January 1, 1985, and elicit additional gas production as an added dividend.

A Free Market In Gas Will Benefit Consumers

Another important benefit of decontrol merits serious attention. The natural gas market has changed greatly in the last year, due to declining real world oil prices and the economic downturn in this country. Gas consumers have complained that prices continue to increase despite a current gas surplus and declining competing fuel prices. They suggest that the market should adjust gas prices downward to compensate for the increased supply and less demand. But we do not have a free market for natural gas; prices are established according to a formula set back in 1978 during conference committee deliberations over the NGPA. The conferees were unable to foresee the fall of the Shah, an initial rise in oil prices, the Iran-Iraq War, an economic downturn, and a subsequent fall in the real world oil price and in the price of alternative fuels. A free market in natural gas at the wellhead would have corrected and adjusted natural gas prices to take into account the events just mentioned. If the framers of the NGPA are to be faulted, it is not for failing to be omniscient, but for believing that any rigid statutory system of price controls could improve upon the workings of a free wellhead market for gas supplies, an alternative which the conferees considered but rejected.

Some gas distribution companies and pipelines have testified before Congress and federal agencies that lower alternative fuel prices, especially those for #6 residual oil, have combined with higher gas prices mandated by the NGPA to reduce or eliminate gas sales to industrial consumers.

It is difficult to apportion blame for any load loss between the declining oil price and the economic recession. But in either case the end result is that customers remaining on the system face higher costs as the pipeline and distribution companies' fixed charges are apportioned among a smaller number of gas customers.

Other Reasons Why Gas Prices Are Increasing

There are several answers to consumers' questions as to why natural gas prices are perceived to be increasing at this time. First is the customer shrinkage and the reapportionment of fixed costs phenomenon just described. In fact, the costs of gas transmission and distribution have been rising, and account for more than one-half of the average residential consumer's bill.

Another reason for higher costs is the normal depletion factor, as old, low-priced reserves are exhausted and replaced by gas from new, higher cost reserves. About ten percent of the nation's gas supply is depleted and replaced in this fashion over an average yearly period. A third factor is the increasing U.S. reliance upon imported gas supplies which, as explained above, constitute a high-priced component of the nation's natural gas mix.

Prices for natural gas at the wellhead do increase under NGPA, but this factor contributes to current problems to a minor extent. NGPA continues to price most natural gas at below apparent market-clearing levels, and limits most price escalations to the yearly inflation level. Insofar as the NGPA raises gas prices above those formerly permitted by the FPC, we must remember that previous low prices resulted in widespread gas shortages during the 1970's. Congress determined that it was in the national interest to raise gas prices above those levels in order to ensure adequate supplies for future use. Of course, to the extent that any current new gas prices do not reflect current market conditions, deregulation of all gas will relieve this situation. We have already indicated that above market clearing prices paid for some gas, especially imports, should decline in response to decontrol. Such market discipline benefits both consumers and gas producers in assuring continued gas marketability at reasonable prices.

Interestingly, the only prices perceived by some to be above market clearing levels which have reacted to current market conditions are those paid for "deep" natural gas. Deregulated deep gas prices had risen to levels of $10.00 per Mcf, leading several pipelines to trigger "market-out" clauses, which either reduce the price of this gas or eliminate it from the pipeline supply mix. The recent average deep gas price was $7.53 per Mcf, and the trend is towards a further decline in that figure.

An Administration Deregulation Initiative Will Have Our Support

We have explained at length why deregulation of all natural gas at the wellhead represents a superior policy alternative. NGSA hopes that the Reagan Administration will soon announce its support for a gas deregulation initiative during the 98th Congress. Passage of a comprehensive decontrol package will provide needed relief from gas market and price distortions caused by nearly thirty years of federal intervention in this area. We appreciate the President's past statements in support of natural gas decontrol. His assistance in gaining Congressional approval of a decontrol proposal will be vital to the success of that effort.

Piecemeal Proposals Would Be Ineffective or Counterproductive

Unfortunately, while decontrol represents the only appropriate policy solution, Congressional and public concern has led to the consideration of other proposals which we believe counterproductive. These fall into three general areas: price freezes, directed contract abrogation, and indirect administrative regulation. We will briefly discuss each approach.

Gas Price Freeze Legislation

Although gas price freeze proposals represent an effort to hold down consumer price increases, they would have no effect on most factors which have caused an increase in gas prices to consumers, for several reasons.

A wellhead price freeze would have no impact upon many of the previously mentioned factors which account for recent increases in residential gas prices. First, a price freeze would not even touch a major portion of a residential consumer's natural gas bill. DOE reports that of the average September, 1982 residential gas bill of $5.60, only $2.53, or 45%, represents the cost of gas itself at the wellhead, which would be affected by a gas price freeze. Over one-half of the residential gas bill consists of transmission and distribution charges, which have also increased and which would be unaffected by a price freeze requirement. If price freeze legislation were enacted, the resulting depressant effect upon natural gas production would actually increase gas prices to consumers as shortages developed and current gas customers left the system.

Second, price freeze proposals do not limit the price paid for imported natural gas and LNG, an increasingly important and high-cost component of the residential natural gas bill.

Third, a portion of recent price increases results from the depletion of old gas reserves and the replacement of this gas with new, higher-priced supplies. A price freeze would not alter this natural process of reservoir depletion, which automatically leads to an increase in gas prices.

Fourth, NGPA-mandated increases in gas prices themselves are the result of a Congressional determination that FPC-imposed rates previous to 1978 were too low and contrary to the national interest. Higher prices were allowed for certain gas to encourage its production and eliminate gas shortages. And in many instances gas prices remain a bargain. According to DOE statistics, last year domestically produced gas sold at the wellhead at an average cost (on an oil equivalent basis) of less than 30¢/gallon. The delivered cost of natural gas to the average residence is only 2/3 that of heating oil, and 1/4 that of electricity, on an equivalent energy content basis. This is the result of our having regulated natural gas for so long at levels far below its true worth. It should come as no surprise that, as permitted by law, the average price of gas in the field continues to increase. Temporary price freeze legislation would make much more difficult the inevitable and necessary adjustment to the laws of supply and demand.

Perhaps the most serious consequence of a price freeze would be its impact on intermediate and long-term supplies available to consumers 3-5 years from now and afterwards. Current gas exploration and development programs are based upon prices set out in the NGPA, coupled with the expectation of new gas decontrol in January, 1985. If those expectations are destroyed, exploration and development programs will be sharply reduced, with obvious impact upon gas supplies.

We expect that legislation of the type some are proposing--a two-year wellhead price freeze and a two-year delay of the partial decontrol scheduled under current law for 1985--would result in a very significant loss of domestically-produced natural gas. Imported oil and imported natural gas would have to be substituted for this foregone production. Any temporary relief for natural gas consumers thus results in increased prices for consumers of gas, heating oil, motor gasoline and other refined products.

Legislative Contract Abrogation

A second group of proposals would abrogate or restrict the operation of contractual provisions such as take-or-pay and price escalator clauses. Natural Gas Supply Association addresses in detail the current and traditional importance of these provisions of a gas sales contract in attachments to my testimony which should provide committee members with a full explanation of our position on this important matter.

The take-or-pay provisions in natural gas supply contracts has been blown way out of proportion. Energy Secretary Donald Hodel recently stated that based on data from the DOE staff, take-or-pay provisions have had no more than a 4% impact on residential prices. He stated that the take-or-pay problem "is not a problem of national scope but rather a problem specific to individual pipeline companies" (Inside Energy/With Federal Lands, December 27, 1982, p. 5). Moreover, it should be remembered that lenders and investors have advanced billions of dollars to major projects in reliance on agreements containing take-or-pay or minimum-bill clauses. Financial institutions have relied on these provisions as credit support for future gas projects according to Jacob Worenklein, a partner in the New York City law firm of Millbank Tweed (Inside Energy/With Federal Lands, October 11, 1982, p. 7) and to John R. Torell III, President of Manufacturers Hanover Trust Company (BNA Daily Report for Executives, November 12, 1982, p. A-16). I should also note that Cong. Philip R. Sharp of Indiana recently requested and received responses by pipeline companies and producers on their efforts to renegotiate contract provisions. In a report by the staff to the members of the Energy and Commerce Committee dated January 27, 1983, the staff reported that a significant amount of discussion has already taken place with respect to take-or-pay obligations and that several producers have reported that take-or-pay renegotiations have been completed to reduce the terms of take-or-pay clauses.

Briefly, however, a take-or-pay clause guarantees the producer a continuing cash flow over what may be a relatively long contract period. In return the pipeline receives an assured supply of gas over the same period. Without a take-or-pay provision a producer has no guarantee that a pipeline will actually take--and pay for --gas volumes which, by contract, can only be sold to that purchaser. In short, they guarantee the producer that he won't be asked to store gas free for the pipeline's account, eliminating his cash flow from the shut-in gas at unforeseeable intervals.

If a pipeline pays for gas which it does not take, most contracts allow for a five-year make-up period, when the prepaid gas can be taken at little or no additional charge, depending upon its market value. Consumers are not charged for prepayments until the gas is actually delivered; interest costs on the amount borrowed to cover the prepayment may be passed-through, however. The character and extent of the take-or-pay obligations in any given natural gas contract depend upon market conditions when the contract was negotiated.

Certain legislative proposals would impose a strict requirement that the pipeline take seriatim its gas in ascending order of cost, leaving more expensive gas shut-in if surplus to the pipeline's current market requirements. In the meantime, this gas would be unavailable for sale to other buyers. In surplus market conditions like the present, this could eliminate most if not all production of deep and tight sands gas, and curtail production of substantial volumes of stripper-well gas and gas from new wells.

This would lead to an inevitable decline in gas exploration and production, with an increased probability of gas shortages once the economy recovers. Producers experiencing 100% shut-ins would be unable to service their debts, resulting in substantial defaults on hundreds of millions of dollars in outstanding loans. The economic implications are obvious.

In addition, legislative abrogation of take-or-pay requirements presents a constitutionality question which would be extensively litigated in the courts. A challenge, regardless of the eventual result, would take years to work its way through the court system. During this period, uncertainty will continue to plague the production industry, resulting in a sharp reduction in drilling activity.

Additional legislative proposals would interdict the operation of price escalator clauses, which are also of current and traditional importance in the natural gas industry. Price escalator clauses further the public interest by guaranteeing producers a price generally reflective of market value over the course of a long-term contract. Historically, the operation of these clauses has been severely limited--sometimes to their exclusion--by federal regulatory authorities. However, producers rely upon these clauses to guarantee receipt of at least the highest regulated gas rate allowed by federal regulations. Again, this price is usually well below market value. In return for the pricing clause, producers have been willing to enter into long-term contracts which are necessary to a pipeline's obtaining financing and meeting future service obligations.

In the absence of legislative tinkering, producers and pipelines will act to mitigate the adverse impacts of any provision in existing contracts. Recent submissions by producers to the House Fossil Fuels Subcommittee indicate that renegotiation of problematic take-or-pay requirements has occurred where necessary to relieve economic hardship of pipeline purchasers. New contracts will, of course, reflect changed market conditions. For example, recent gas contracts usually contain market-out clauses and lower take obligations, emphasizing a perceived need on the part of gas buyers to reduce their exposure to high-cost components of their gas supply.

Indirect Administrative Regulation

A variation of the "directed take" gas requirement appears in bills which seek to enlarge the authority of the FERC to review the purchase practices of natural gas pipelines. The Commission would be given the authority to limit or deny passthrough of purchased gas costs where the pipeline gas purchase contracts contain certain common pricing or take provisions.

The NGSA opposes these indirect efforts for the same reasons I mentioned in connection with the direct proposals to interfere with these clauses: such interference would impair the producer's expected revenue stream, create uncertainty and possible collapse in the investment and lending communities, and have a chilling effect on further exploration and development programs that are needed to provide gas for the future.

For example, some of the proposals, including one offered by Chairman Jepsen, would add a definition of the term "abuse" as it is used in section 601 of the NGPA. Abuse would include imprudence on the part of a pipeline and the presence in any existing contract of a provision which materially prevents the pipeline from responding to changes in customer demand or other market forces. The presence of a take-or-pay percentage greater than 70 percent, an indefinite price escalator clause not tied to an economic indicator, or a most-favored-nation clause, or the absence of a market-out clause would, under the bill, create a rebuttable presumption of abuse.

This type of proposal would allow the FERC to deny a pipeline passthrough of gas costs because a contract may have been negotiated and signed several years before this legislation was proposed or before the passthrough in question was challenged. In the face of this possible second-guessing by Congress and the FERC, the pipeline may have no alternative but to attempt to avoid the obligations in his contract with the producer.

On the other hand, if the pipeline complies with the terms of the contract, Commission denial of passthrough, presumably only after notice and hearing, may occur months after the pipeline has paid the producer. In effect, a substantial portion of the payments made to producers would be subject to possible recoupment demands by the pipelines. This revenue uncertainty would create the same type of cash flow and financing difficulties inherent in the price freeze proposals which I discussed earlier. There could be no price certainty, because the rate proceedings would drag on for years. The uncertainty and any denials of passthrough would adversely affect supply and, ultimately, prices.

For these important reasons the NGSA does not believe the proposed limitations on pipeline passthrough present a workable solution to the many problems that exist in the natural gas industry, although we appreciate the genuine concern about current natural gas policy expressed by the sponsors, including the Chairman of this Committee.

Conclusion

NGSA recognizes that there is a need to find a workable solution to the natural gas problems facing the nation. We also recognize the serious and legitimate concerns on the part of many members of the Congress which have prompted them to propose immediate relief for residential natural gas consumers.

Enactment of piecemeal solutions to this most complex problem, even for a short time, could result in more, not less, damage to the nation's consumers and to the industry that has been built to supply them with this commodity. The natural gas issue presents complex problems affecting pipeline companies, distribution companies, large, middle-sized and small producers, the Federal Energy Regulatory Commission, state regulatory commissions, industrial users as well as residential consumers. The present law was enacted after months and months of consideration of the many aspects of this complex puzzle.

The NGSA firmly believes that the present market situation compels us to replace the NGPA with a comprehensive legislative package centered around deregulation of all natural gas prices at the wellhead. Current market conditions suggest that we can now obtain the significant long-term benefits of decontrol with minimal short-term impact. We hope this Committee will join us in the conclusion that wellhead deregulation is the policy which best serves the consumer's long-term interests.

ATTACHMENT "A"

ACTIVE CANADIAN GAS PROJECTS

Purchasing Company	Service Area (By State or Census Region)	Canadian Supplier	1981 Imports (Bcf)	Remaining Volumes Under NEB License (Bcf)
Great Lakes Gas Transmission Co.	Minnesota, Michigan	TransCanada Pipelines Ltd.	92.7	1,301.3
Inter-City Minnesota Pipelines Ltd.	Northern Minnesota	ICG Transmission Ltd.	5.5	122.9
Michigan Wisconsin Pipeline Co.	E.North Central W.North Central	TransCanada Pipelines Ltd.	13.2	172.6
Midwestern Gas Transmission Co. (Northern System)	Minnesota, North Dakota, Wisconsin	TransCanada Pipelines Ltd.	101.1	850.8
Northern Natural Gas Co.	E.North Central W.North Central Mountain	Consolidated Natural Gas Ltd.	25.0	372.8
TOTAL:			237.5	2,820.4

ATTACHMENT "B"

NEWLY OPERATING CANADIAN GAS PROJECTS

Purchasing Company	Service Area (By State or Census Region)	Canadian Supplier	Start-up Date[1]	Contract License Expiration Date	Max. Potential Imports Per Year	Total Volume under NEB Licens (Bcf)
Michigan-Wisconsin Pipeline Co.	E.North Central W.North Central	Pro-Gas Ltd.	Fall, 1982	1987	27.4	150.5
Northern Natural Gas Co.[2]	W.North Central E.North Central	Pan-Alberta Gas Ltd.	Fall, 1982	1987[3]	73.0	N.A.
Northern Natural Gas Co.	W.North Central E.North Central	Consolidated Nat. Gas Ltd.	Fall, 1982	1987	41.6	373.0
Natural Gas Pipeline Co. of America	W.North Central E.North Central	Pro-Gas Ltd.	Fall, 1982	1987[3]	27.4	150.5
TOTAL:					169.4	N.A.

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[1] Start-up date represents the earliest date that importing can occur according to the contract and the projected completion date of the construction of the transportation related facilities.

[2] Canadian gas is first sold to the Northwest Alaskan Pipeline Co. and then resold to the U.S. companies.

[3] Approval is being sought that will increase deliverability or extend the time frame of the license.

Attachment 1 to NGSA Testimony

TAKE-OR-PAY

Just suppose that you own a bakery. You've invested in ovens, signed a lease for a building and hired employees. And suppose somebody offered to have the exclusive right to buy bread from you for 20 years and to pay you the going price for each loaf he bought. There is one little problem: he could give you no assurance that he would buy any particular number of loaves. Would you take his deal?

Of course not.

Just as a baker needs an assured market for his bread in exchange for tying up his output for 20 years, a gas producer needs enough assurance of a steady cash flow to meet his obligations to bankers, suppliers and employees. The mechanism that has evolved to do this is the take-or-pay provisions in gas contracts. Now, take-or-pay provisions have come under heavy attack in some quarters as being "against the public interest" and causing market disordering problems. In reality, the public is well served by these provisions, since they encourage long term stability of supplies and rational price planning and offer a cheaper alternative to storage by pipelines.

Actually, the term "take-or-pay" is misleading; it really should be "take-or-prepay." That is, a prepayment is made today for gas to be delivered later. The make up feature of take-or-pay has been largely ignored in recent discussions of natural gas issues.

In the early years of the gas industry, there was no need for take-or-pay provisions. Gas was a comparatively valueless by-product of oil production, and it was sold whenever a market happened to be available, usually to a nearby gasoline plant. But with the advent of large diameter, long distance pipelines and greater demand for gas, gas itself could be explored for, developed and produced as a valuable commodity. With gas as the major product on a lease, it had to carry the burden of all of the costs of exploration and production; and for this there was a real need for a steady, reliable flow of income to the producer. Take-or-pay was the method which buyers and sellers developed to achieve this.

Next to the pricing provisions, the most important provisions of a gas sales contract are those which specify the quantity of the gas to be purchased. The producer wants to sell his gas as rapidly as his wells will produce it and the pipeline can take the gas into its facilities. Hence, he tries to contract to require the buyer to take as high a percentage of the capacity of his wells to deliver gas as he can. During the shortage period in the late 1970's, pipeline buyers, who needed more gas than they could buy and were curtailing their customers, were willing to sign long-term contracts providing for high percentage "takes" from the producer. In many cases the producers drilled additional wells to enable the gas to be produced at a more rapid rate to meet the urgent pipeline demand.

From the viewpoint of the pipeline, it is desirable to get as many gas reserves contracted to the pipeline as possible in order to protect the long-term supply security of the pipeline and its customers. That need must be considered with -- or balanced against -- the short-term need to meet all the current demands of its customers. Thus, the pipeline buyer must adjust its gas purchase program to continually assure its long-term supply, while at the same time assuring itself that it has enough gas to meet all of its customers' demands, but not too much gas so that it would be found to violate the "take" or quantity provisions of its contracts with its various producers.

The take-or-pay requirements of his contract are the producer's only protection against predatory buying practices of a pipeline, which could, absent this provision, tie up a producer's reserves under a long-term contract and then refuse to permit their production by refusing to take the gas into its system. This was the very practice that the clause was initially designed to prevent. After all, in most cases there are not too many potential buyers close enough to offer to purchase a new gas supply.

It is important to keep in mind that in talking about "producers" or "sellers" we are not talking about a single company or even a small group of companies. Instead, pipelines buy from thousands of producers and have individual contracts with each one. It would not be fair, logical, or "in the public interest" for a pipeline to favor one producer over another, taking one person's gas while leaving another's in the ground. In fact, if two or more producers are selling gas from the same reservoir, the gas will move underground through the rock to the wells which are producing -- and away from wells which are shut-in. This means that the producer whose wells are not producing can actually have his gas drained away by another producer whose wells are producing.

Furthermore, a producer, especially a small producer, needs a steady income from his wells in order to pay his fixed costs, operating costs and taxes. In many instances, the steady income from existing production provides the collateral on which a producer borrows money to continue to drill wells to explore for and develop new gas.

It is assumed that the existence of a take-or-pay provision is solely for the benefit of the seller. But, a buyer has a real interest in keeping an assured supply. Without take-or-pay, long term contracts for gas supplies would be rare, leaving buyers with the inability to finance pipelines and attract markets. And the level of take-or-pay will in part determine the number of wells to be drilled on a lease and the size of surface facilities to be installed, which in turn affect the volume of gas available to the purchaser on any given day.

A take-or-pay provision is designed to meet the needs of both the producer and the pipeline. It provides that the buyer must take a minimum quantity of gas, on a daily, monthly, or annual basis, but, if he does not take this quantity of gas, he must pay the producer as if he had taken it. This does _not_ mean that the pipeline pays more money for less gas. The reason is that the pipeline has a right to "make up" the deficiencies in takes, either at no cost or by payment of a small price differential if the price of the gas has increased between the time the payment is made and the gas is taken into the system. Thus, in the normal course of events, the pipeline is able to operate its system with necessary flexibility, increasing or decreasing its takes as demands of its customers vary, because of weather conditions, economic changes, etc. The producer receives a steady minimum income to meet his operating costs, taxes and other obligations. And the pipeline's customers only see the carrying charges on take-or-pay amounts, not the full amounts paid, in their rates.

We can speculate what the gas industry might be like without take-or-pay provisions. Since take-or-pay is a trade-off for long term commitments, producer/pipeline contracts would be significantly of shorter duration. Surely there would be a major change in pipeline financing, requiring more equity participation, shorter amortization periods and, presumably, higher rates to offset the greater risks of loss of gas supply. Producers could be expected to develop properties more slowly and perhaps to demand higher prices in return for the uncertainties of cash flow. Short-term, spot sales could lead to shortages on one pipeline system with adequate supplies in others. In short, chaos could supplant stability -- and the consumer is the loser.

One of the early methods used to set the amount of take-or-pay was to relate the amount to be taken or prepaid (the daily contract quantity or DCQ) to the amount of original recoverable reserves covered by the contract. Thus, a DCQ of one Mcf per day for each 10,000 Mcf of reserves would theoretically deplete the reserves in about 27 years. The 1:10,000 formula in time gave way to 1:8,000 (22 years) and 1:7,300 (20 years). Other reserve based formulas were used as well.

But problems developed in basing average daily takes on reserves. One was the inexact nature of reserve estimation; engineers of buyers and sellers often disagreed on just what the recoverable reserves were. Sometimes, arbitration was the only way to resolve differences. In any event, having to agree on reserves every year or two resulted in an inefficient use of technical personnel.

Of even greater significance was the need of pipelines, not so much for long-term supplies (which were sorely needed, too), but for gas immediately to serve their markets. But the interstate pipelines, unable to compete for new supplies in price, found they were able to compete by offering higher take-or-pay levels.

What then developed was a switch from reserve-based take-or-pay levels to a method which gave buyers more gas and sellers more cash for development. That was the use of a percentage of daily gas deliverability to establish the DCQ level. Deliverability is easily determined and redetermined by actual tests, not by estimation, an advantage in time and manpower to both buyers and sellers. The actual percentage to be used was negotiated by the parties, and it has varied extensively depending on many factors, including the number of wells to be drilled, the size of optimum surface facilities, the capacity of the buyer's pipeline and the buyer's need for gas. In general, the percentage ranged from a low of 33-1/3% to a high of 90%. The weighted average percentage was probably around 80%. The time over which the take-or-pay obligation was to be met was sometimes a day or a month but most frequently a year. The time for make up also varied, but, since the FPC mandated at least a five-year make up for sales under the Natural Gas Act, the five-year make up term spread to intrastate sales as well. Make up over the remaining term of the contract -- and sometimes beyond that -- was not infrequent, however.

Problems are now being experienced by some pipelines because the two objectives of the pipeline purchaser find themselves in conflict with each other. Many pipelines are experiencing a "deliverability surplus" due to the fact that the demands of their customers are less than the pipelines anticipated due to the economic recession and the reduction in prices of fuel oil, which competes with gas in many markets. At the same time, these pipelines have a continuing need to buy gas to meet their long-term needs, 5 to 15 years from now. Thus, pipelines are increasingly finding themselves potentially liable under the take-or-pay provisions of their contracts to pay for gas which they cannot currently take into their systems.

This fact is not a cause for panic or precipitous or ill-considered Congressional action. The operations of the industry and the clauses themselves will correct this problem, if it is a problem, over a fairly short period of time. This is so, because:

1. The make up provisions of the gas sales contracts will allow the pipelines to receive gas supplies which they have paid for in the future, at a time more convenient to the pipeline.

2. The buying practices of the pipelines in new contracts will reflect the surplus deliverability situation, and the new contracts will have lower percentage take requirements and more liberal make up clauses than earlier contracts. In extreme situations, the pipeline may simply suspend new purchases until some of the take-or-pay balances are made up.

3. If situations become too extreme, producers will renegotiate these requirements on an individual contract basis to avoid pipeline hardship.

4. In any event, any problem that exists will disappear when the nation's economy revives.

Much of the criticism of the take-or-pay clause comes about because of the many different prices at which natural gas, a fungible and homogeneous commodity, is sold. This is true, not because of the contracting practices of producer and pipeline, but because of federal regulation. Prices paid for gas in the various NGPA categories vary widely, from 45 cents per MMBtu to over $9.00. These prices vary between fields, between producers, and between individual wells -- and sometimes even in the same well. It is inevitable in such a system that, at times, some 45 cent gas will be shut-in (and paid for) while more expensive gas is purchased by the same pipeline due to contract obligations and system demands and pressures. This is not done because the pipeline wants to pay more for its gas supply; on the contrary, it wants to do just the opposite in order to conserve its markets, meet regulatory objections, etc. But the pipeline cannot arbitrarily shut-in some fields because they are high priced, or for any other reason and produce others. It must meet its contract obligations in each field with each different producer.

The solution to the problem is not, as some suggest, to "tinker" with a single part of the contracts entered into between the producer and pipeline. Rather it is to abolish, or reduce, the artificial and meaningless price differentials imposed by law and regulation upon gas from varying "vintages," sources and sellers.

Over the years, there have been some suggestions that the use of take-or-pay provisions, freely negotiated to suit the needs of buyers and sellers, was somehow improper. Indeed, the Federal Power Commission twice considered the desirability of take-or-pay provisions. In each case, the FPC concluded that such provisions were necessary in the industry and that the level of take-or-pay was to be best left to the parties to a contract.

Again today, take-or-pay (without mentioning the make up related to it) is being blamed for the perceived ills in gas markets. With demand for gas reduced because of general economic conditions, take-or-pay provisions will work to do exactly what they were designed to accomplish -- they give producers assured cash flows, provide a cheap alternative to storage by pipelines, and provide a cushion of prepaid gas for make up when the pipelines need it.

Notwithstanding contractual take-or-pay obligations, individual sellers are reaching accommodations with their buyers in relaxing those provisions. This is being done in recognition of the unique circumstances in today's marketplace. This is clear evidence that, just as price signals are being received by producers about interfuel competition, demand signals are being read. The free operation of market forces is working -- working far better than a legislative "solution" to a non-existent take-or-pay problem.

Attachment 2 to NGSA Testimony

INDEFINITE PRICING PROVISIONS IN A GAS SALES CONTRACT

A. Introduction

Indefinite pricing provisions have been an integral part of most gas sales contracts from the inception of the industry. Indefinite pricing clauses provide a mechanism for buyers and sellers to adjust the price of the gas to variations in its market value over the duration of a long-term (15-20 years or more) gas sales contract. Recently these provisions have come under attack.

The rationale for and operation of these diverse contract provisions are not, unfortunately, well understood outside the natural gas industry. It is therefore important to clearly understand:

1. What an indefinite pricing clause is, and why it has long been a standard feature of gas sales contracts.
2. The various types of indefinite pricing clauses in existence and the relative merits and disadvantages of each.
3. The political history of such clauses and the decisions of the United States Supreme Court, Circuit Courts and State Courts interpreting and enforcing such clauses.

B. The Rationale Behind The Indefinite Pricing Clause

With the construction of major interstate pipelines, vast new markets for natural gas were developed. With the increased demand for gas, a very significant change occurred. Contracts for gas were being written for much longer terms than before, often for at least twenty years and sometimes much longer, as in the case of contracts covering the producing life of a property which could last fifty or more years. This change to extremely long-term contracts was necessitated by the need for significant capital to finance these new interstate pipeline systems. To obtain the necessary permits, certificates, and approvals, the FPC (now the FERC), the Securities and Exchange Commission (SEC), and the investment bankers who were providing the money had to be convinced that sufficient volumes of gas were committed to the project to satisfy the pipeline's market demand, amortize its indebtedness, and provide a reasonable expectation of profit. Both the regulatory agencies and the pipeline companies' bond buyers insisted upon firm long-term contracts for established volumes of gas for the full term of the bonded indebtedness. Thus, in order to sell his gas to the burgeoning interstate market, the producer was forced to acquiesce in contracts of long duration.

After the Supreme Court decision in the Sunray case, 1/ the commitment of gas to an interstate pipeline under the Natural Gas Act of 1938 (NGA) became, for practical purposes, a commitment for the life of the reserves, regardless of the term of the contract, as authority was required to be granted by the Federal Power Commission (FPC) under Section 7b of that Act before the "service" could be "abandoned."2/ As the FPC refused, as a matter of practice, to grant such authority until the reserves were depleted, a sale to an interstate pipeline became effectively a sale for the life of the field, even though new contract terms could be negotiated when the term of the contract expired.

Because of the basic requirement for a long-term contract, one of the most important, and most difficult, features of a gas sales contract is the need to arrive at a fair price over the entire term of the contract. Prior to 1950 when gas was a by-product discovered in the search for oil, and was in oversupply, the initial price was very low. The producer was often willing to agree to a low-initial price to encourage the construction of the pipeline to

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1/ Sunray Mid-Continent Oil Co. v. F.P.C., 364 U.S. 137 (1960).

2/ California v. Southland Royalty Co., 436 U.S. 519 (1978).

provide a market for his gas, with "escalation" or price increase provisions to bring the gas price up to its fair market value at some later point in time in the contract period.

It was very difficult (and still is) for the parties to anticipate, at any particular point in time, what the fair market value would be ten to twenty years in the future. "Fixed Escalation" provisions which provided for a fixed amount of increase in the price at periodic intervals proved to be badly off the mark, as demand for natural gas developed rapidly in the 1950's, 1960's and 1970's.

The solution for the problem was the "indefinite" price escalator clause. It attempts to establish the price of gas sold under a contract as nearly as was practical to the _current_ market price of gas in a producing area as reflected by new contracts entered into from time to time. As we shall develop, these clauses had many defects, but they came much closer to reflecting the "market value" of the gas _when it was actually produced_ 3/ than any fixed escalator or fixed price provision. In so doing, the price for gas could be compared not only with the field price for gas but with the price for oil, for products, for coal and for other mineral resources, which are customarily priced at

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3/ _Texas Oil & Gas Corp_. v. _Vela_, 429 S.W.2d 866 (Tex.1968).

the market value at the time they are produced and delivered, not the market value many years earlier.

A natural gas producer ordinarily obtains a lease to drill on a person's property; this may be an individual, or the state or federal government. In exchange for the lease, the producer is obligated to pay "royalty" to the land owner. Many royalty agreements contain provisions which require that the producer measure his royalty payments based on the "market value" of the gas. "Market value royalty" clauses have resulted in a plethora of litigation over the "market value" of the gas. The result in many cases is a requirement that an effective indefinite pricing clause must be part of the sales contract. For example, under Texas law "market value" is determined for royalty purposes by the prevailing market prices on the date the gas was actually delivered.4/

C. Types Of Indefinite Escalation Clauses And Their Relative Merits.

1. The "Favored Nations" Clause

One of the earliest types of indefinite escalation clauses is the "favored nations" clause, which provides that the price under the contract will increase to the price paid by the same buyer in the same market area for gas of

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4/ Ibid.

comparable quality. The purpose of this clause was to insure that the first sellers of gas in the market area (which could be as small as a single field) received the same price paid by the buyer to other sellers in the same area. This was expanded to a "three-party" favored nations clause, which required an increase in the price to that paid by any buyer in the same market area for comparable gas.

As early as 1960, the FPC and the United States Supreme Court reviewed, and construed as a normal contract provision, a two-party favored nations clause.[5] The Court did not regard the provision as inherently bad or against public policy.

2. Price Redetermination Clauses

A second type of indefinite pricing clause, used in lieu or of in conjunction with the favored nations clause, was the price redetermination clause. This clause simply allowed one party to give notice to the other that he desired to renegotiate the price. A provision which stops there is often not satisfactory from the standpoint of the producer/seller, because at the time the price is renegotiated the parties may no longer be in an equal bargaining position. The field may be partially depleted, and new buyers more difficult to obtain. Moreover, as to interstate sales prior to December 1, 1978, the seller could not sell to another party because of the Sunray decision. Therefore, the clause often set a target for the renegotiations, such as "the market price for gas of comparable quality" in the same market area. Arbitration clauses were often added in case the parties could not agree on what the market price was at the time. Even assuming the parties could agree on the correct "market price" for one negotiation, the price determined becomes increasingly inaccurate over time until the next redetermination is made.

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[5] Texas Gas Transmission Corp. v. Shell Oil Co., 363 U.S. 263 (1960).

3. Prices Referenced To The Price Of Competitive Fuels.

In theory the correct market price for gas at any point in time should be equivalent to the price which the consumer would have to pay for an alternative fuel if gas were not available. Because of the difficulties above discussed in administering the favored nations and price redetermination clauses -- deciding what gas is "comparable" or what the correct "market value" is -- additional indefinite pricing provisions were sometimes added, either concurrent with or in addition to, the other clauses above discussed. These clauses allowed price increases to the level of the price of crude oil, or No. 6 fuel oil or No. 2 fuel oil or some fraction therefore, in a specific market area. These prices had the advantage of being readily ascertainable, because they are published in industry or governmental periodicals. The primary disadvantage was that such prices reflected only partly, if at all, the costs of transportation and distribution of the gas to the burner tip, which is the actual point of competition with the alternate fuel.

Such clauses also could not reflect the cost of converting energy burning equipment from one fuel to another, which varies widely with the size of the equipment and the end use involved.

4. Pricing Clauses Based On Indices.

A good example of a clause relating price to an index is the inflation adjustment factor which is incorporated into the NGPA ceiling price by Section 101 of the NGPA. This Section is an explicit recognition by Congress that long-term gas prices must be adjusted at least to offset inflation, if the parties are to be treated fairly. The adjustment is made monthly and is based on the Gross National Product Product Implicit Price Deflator.

5. Area Rate Clauses.

This type of clause permits the contract price to change in accordance with variations in a ceiling price prescribed by law or regulation. The FPC in 1960 prohibited the use of indefinite pricing clauses prospectively in contracts for the sale of gas in interstate commerce for resale as a part of its general "price freeze" strategy until area rates could be established.6/

After the issuance of the Permian Basin Area Rate Decision in August 1965, the FPC, permitted the use of provisions which would adjust the price to the ceiling rate established by the Commission for each producing area.7/ Such provisions were known as "area rate clauses," and quickly became standard in all interstate contracts entered into after that date.

The obvious defect in this type of provision is that it is dependent on the existence of a governmentally-determined ceiling price. When price controls are removed, the mechanism to trigger this provision in the future will no longer exist. While a price in effect on the decontrol date should not be rolled-back, such a clause can have no other prospective operation after decontrol.

6. "FERC-Out" Clauses.

Thus far we have discussed indefinite pricing clauses which operate for the benefit of the producer/seller. Gas sales contracts today commonly

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6/ Order No. 232, 25 F.P.C. 379 (1961); Order No. 232-A, 25 F.P.C. 609 (1961); Order No. 242, 27 F.P.C. 339 (1962).

7/ Order No. 329, 36 F.P.C. 925 (1966), incorporated into the Regulations at 18 C.F.R. § 154.93(b-1).

contain two indefinite pricing clauses which operate for the benefit of the buyer. The first of these is a "FERC-out" or "flow-through" clause. It provides in essence that if the FERC or other appropriate governmental agency does not permit the pipeline purchaser to "flow through" the price provided in the gas sales contract to its customers, then the price paid the producer will be reduced by the amount not permitted to be taken into the pipelines' cost base.

7. The "Market-Out" or "Economic Out" Clause.

The basic theory of these clauses is to permit the pipeline to reduce the contract price paid the producer if the pipeline's weighted average cost of purchased gas, plus its transportation costs and return, exceed the market price of alternate fuels in its market area. The clause takes many different forms, varying all the way from unfettered discretion in the pipeline to reduce its price, to specific parameters under which the clause can be invoked coupled with the right in the producer to cancel the contract and resell to other parties utilizing the pipeline buyer's transportation system at standard rates.

D. Are Indefinite Pricing Clauses In The Public Interest? Judicial History Of Issue

From the foregoing discussion it is apparent that indefinite pricing clauses are an indispensable element of a long-term gas contract which commits gas for sale and delivery in future time periods. This is so because the economic conditions which may prevail over the term of such a contract simply cannot be foreseen at the time the contract is entered into. The only real alternative is to abolish the long-term contract, and sell gas on a "spot" or short-term basis, as oil and other commodities are sold. Such an approach would be inconsistent with the desire of the pipelines and their financiers to protect the useful life of their investment in pipelines, and the desire of the end users to dependable "service" and assured gas supplies for the long term.

The view that indefinite pricing clauses somehow are "against the public interest" seems grounded on several false premises such as:

1. The idea that the initial price in a long-term gas sales contract is the only price bargained for by the parties, and that escalation clauses are somehow adverse to the parties' agreement.

A seller bargains for all the pricing clauses in the contract, including the indefinite pricing clauses. If these clauses are deleted or impaired then the parties' bargain is changed in an unfair and one-sided direction.

2. The idea that the initial price has some relationship to the "historic" or "original" cost of the gas to the producer and that increases in the price are not "cost justified."

An attempt to apply a utility-type cost-of-service approach to producer pricing has been a failure and led to the shortages of the 1970's. The "unit cost" of the gas produced from one well can differ dramatically from the unit cost of gas produced from another well and bears no relation to the value of the product sold. Attempts by the FPC to find some correlation, even on a national-average basis, met with total failure.

3. The idea that a gas producer, unlike every other sector of our economy, public or private, should not be allowed to realize the increased value of his assets (gas reserves in place) over time, and that he must pass on this increased value (economic rent) to the gas consumers.

This concept is the father of the inflammatory phrase "windfall profits," which led to the adoption of the multiple vintage pricing system. It currently applies to some 25 different prices to an identical commodity, based on such extraneous circumstances as the date the well was drilled, the date the contract was signed, whether the sale was intrastate or interstate, the size of the producer/seller, whether the well is a new well or a recompletion, etc.

E. Conclusion.

The real reason why indefinite pricing provisions may be viewed with suspicion by some, is that they operate to produce market prices which those persons regard as "unfair" or "too high" according to their own preconceived notions of price. This view led Judge Brimmer, United States District Judge in Wyoming, to hold that indefinite pricing clauses were invalid as against public policy.[8] The Tenth Circuit reversed, holding that federal public policy as reflected by the NGPA specifically recognized and permitted indefinite pricing clauses to operate up to the maximum rate established in the Act.[9]

A similar result was reached by the Wyoming Supreme Court in Amoco Production Co. v. Stauffer Chemical Co., 612 P.2d 463 (Wyo. 1980). The Court said:

> "Favored nations clauses are a common feature of gas purchase and sale contracts. The nature of the product and its questionable availability engenders reluctance on the part of producers to enter into long term contracts at the price prevailing at the time of contract. Yet purchasers require long term commitments to insure an adequate supply of gas. A two-party favored nations clause provides an increase in price to match any higher price which the purchaser pays to any other seller. A third-party favored nations clause requires the purchase to match any higher price contracted to be paid by any other buyer in the same field or area. . . . Favored nations clauses are recognized by the courts." (673 F.2d. at 327-328).

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[8] Kerr-McGee Corp. v. Northern Utilities, Inc., 500 F.Supp. 624 (D. Wyo. 1980).

[9] Kerr-McGee Corp. v. Northern Utilities, Inc., 673 F.2d 323 (10th Cir. 1982), cert. denied Nov. 8, 1982, 51 USLW 3357.

It seems clear that indefinite pricing clauses have long been, and should continue to be, an integral and inseparable part of any long-term contract for the sale of gas. Such clauses are the only way to equitably provide for the continuing sale of the gas at its approximate market value at the time it is delivered. Cancellation or impairment of such clauses in existing contracts may "trap" the gas committed by such contracts to inequitable sales, but will at the same time prevent the future sale of any uncontracted for gas under long-term contracts. It is this type of short-sighted attempt to "protect" the short-term interest of the "consumer" which has led to the pricing mess we find ourselves in today.

History has demonstrated that attempts to freeze prices, whether directly through the imposition of price controls, or indirectly through the impairment of contract provisions which do not permit market value price increases, is certain to result in disastrous effects on consumers and on the industry that has been built to serve them.

Senator JEPSEN. Thank you. Now, we will recognize Jerome McGrath, and would you also please just quickly change chairs. Mr. McGrath represents the Interstate Natural Gas Association of America. Is it correct to say that this involves most of the pipeline industry?

Mr. MCGRATH. Yes, sir.

Senator JEPSEN. Mr. McGrath, your prepared statement will be entered in the record as if read, and you may proceed in any manner you so desire.

STATEMENT OF JEROME J. McGRATH, PRESIDENT, INTERSTATE NATURAL GAS ASSOCIATION OF AMERICA (INGAA)

Mr. MCGRATH. Thank you. I also wish to associate myself with your opening remarks as a very succinct and accurate assessment of the situation. Much which has been said already by Mr. Means and Mr. Bush I would echo. I would like to give you for the record the perspective from the interstate pipeline's point of view, if I may.

As you know, the interstate pipelines are the link between the producing segment and the distribution arm which sells to the ultimate consumer. We operate an extensive network of pipelines in the United States, and have for many, many years. They cost billions of dollars. Prior to 1978, at the time that the Natural Gas Policy Act was passed, the natural gas reserve available to the interstate market not only had declined, they had declined to a very serious level. People have short memories, but I'm sure many Iowans, certainly many people elsewhere in the United States, recall the winter of 1977 when we were closing plants and schools in many areas because of the drop in pressure of the lines. There were some communities threatened with being cut off entirely from natural gas service. That never occurred, thank the Lord, but something had to be done.

Natural gas is a vital energy commodity to this country. It is a premium fuel, and something had to be done to reverse the downward trend in the expiration and development for that commodity. The Natural Gas Policy Act was passed, and it achieved some of its objectives. All of us look at it today, and it truly is a monstrosity so far as a piece of legislation is concerned, as Mr. Bush pointed out, some 28 different pricing categories for one single commodity. But it did create the incentive for expanded expiration and development for the producers to go out and drill the holes to find the gas you heard Mr. Bush mention, 15,000 feet or below, drilling that deeply to find natural gas, and the situation was turned around. Today, there are adequate supplies of natural gas for the interstate market for the citizens of Iowa and elsewhere.

Now, some have talked about the surplus. I wanted to clarify that very carefully. Today, there is a surplus of natural gas. Why? Because of the deliverability of gas from the producing fields in the southwest brought about by a number of factors, not the least of which is the contract problem which was alluded to earlier requiring in certain fields what we call take-or-pay commitments. This is that clause of the contractual obligation that the pipelines have with the producers, and because of the physical characteristics of certain natural gas fields, particularly those in the Gulf of Mexico which require rather rapid production, there is a very high amount of gas deliverability, deliverable gas available to the interstate systems. And just as that is occurring, we have several other factors merging together, such as the conservation, which you mentioned, which has been very significant in all segments of usage, residential, commercial, and industrial.

We've also had probably the most serious recession in modern times to hit us with the economy at a low ebb, from industrial users, which are the backbone of the industry in terms of providing year-round revenues, to not only the distribution companies, but to the pipelines and producers falling off the systems like dead flies because of the economy. Many of those industrial users will never come back. Or others have switched to oil, which because of the rather unexpected decline in oil prices over the past 2 years, has resulted in many areas in selling at a price below natural gas.

Now, you have mentioned accurately the rigidities of the Natural Gas Policy Act. They are rigid. They provide for specific price escalation on a monthly basis for the various categories of gas, and that is designated or determined to be the maximum lawful price. So in the process of acquiring gas, the pipelines have entered into contracts with producers, and I might say, and I want to emphasize this, natural gas is not a shelf item. You don't run into the store or the filling station and say, "Give me a thousand cubic feet of natural gas." It takes many years of planning. The gas that the Iowans are receiving today in all liklihood is the result of planning made in the late 1970's, and even going back to the 1960's for acquiring new gas supplies, and building new facilities to bring the gas eastwardly to market. Those are commitments made under long-term contracts. And if I were a producer selling to you, a pipeline, in 1975 for delivery to Davenport, Iowa, in 1983, I would surely want to have a provision in my contract which would allow me over that period of time to charge a price that would reflect the increasing cost to me, as well as what the law provides for me to have.

The problem is that the contracts, because they are tied to the Natural Gas Policy Act, do not provide the ability of either the pipelines or the distributors to go down, and that is why we say that in today's climate had we the freedom to negotiate absent the regulatory restrictions, the statutory restrictions that apply, we would be able to adjust to these market prices that you see today. We would be able to address the high prices which the consumers in Iowa are now having to pay.

Senator Jepsen. May I interrupt just a minute, because I want to get this in the record and make sure I understand. I heard you just say that the 1978 act prohibits two willing partners to get together and negotiate a change downward in the prices.

Mr. McGrath. Well, it does not prohibit that, Senator, but it does——

Senator Jepsen. I thought that's what you said.

Mr. McGrath. What I'm saying is that the contracts provide for payment by the pipeline to the producer at the maximum lawful price as prescribed by the Natural Gas Policy Act.

Senator Jepsen. That's right.

Mr. McGrath. Now, those are long-term contracts. Now, it does not prevent the pipelines and the producers from trying to renegotiate those contracts to void those provisions, and, as Mr. Bush has mentioned to you, the producers and pipelines, our companies have been negotiating with the producers now for some months. I will have to report to you as he did, that the major success in those negotiations has been in getting reduction in the take-or-pay volumes. Getting a reduction in price has been very, very difficult. I might say that we have something like—I don't know the exact figure—over 30,000 contracts between pipelines and producers; that it's just virtually impossible to renegotiate all of those.

Senator JEPSEN. I understand. I just want to make that point to clear it up.

Mr. McGRATH. I'm sorry I misled you on that. It's not that ironclad, it's just that the straitjacket is there, and trying to work ourselves out of the straitjacket is very difficult.

My time is running. I do want to say that, as I indicated, that we are negotiating with producers to try to work these out, but in our opinion, legislation is sorely needed. I might add that we have looked with great interest at your bill, Senator, S. 239, and while our approach to the problem may be somewhat different, there are many areas in which we agree on the concept. It's the manner in which we believe it ought to be handled. For example, on take-or-pay, I believe your bill would have the take-or-pay go down to 70 percent under the contracts on file with the Commission, and the Commission would eliminate that provision. We would rather go down to 60 percent of deliverability under the contracts and provide statutorily, that higher takes ought to be prohibited rather than leaving it up to the Federal Energy Regulatory Commission to do so.

We would also put a pricing cap on the indefinite pricing clause in contracts. I believe your bill would again provide for the Commission under section 601C2 of the Natural Gas Policy Act to restrict the use of those contracts. We would do it statutorily. So there are many areas where your approach is similar to ours.

Something needs to be done. It needs to be done in a hurry, but it is a combination of the law, the contract, the economy, and all these factors converging at a time when natural gas prices are increasing, and we commend you for holding these hearings. We wish to work with you and your staff, and hopefully we can reach a resolution of these very difficult, complex problems.

[The prepared statement of Mr. McGrath follows:]

PREPARED STATEMENT OF JEROME J. MCGRATH

Mr. Chairman and Members of the Committee:

My name is Jerome J. McGrath. I am President of the Interstate Natural Gas Association of America (INGAA), a national trade association whose membership is comprised of virtually all of the major interstate natural gas transmission companies operating in the United States.

INGAA member companies account for over 90% of all natural gas transported and sold in interstate commerce. All of our member companies are subject to the jurisdiction of the Federal Energy Regulatory Commission (FERC) as mandated by the provisions of the Natural Gas Act (15 U.S.C. 717, et seq.) (NGA) and the Natural Gas Policy Act (15 U.S.C. 3301, et seq.) (NGPA).

I am pleased to appear before the Committee on behalf of INGAA, to discuss our view of the current natural gas market problems. First, I wish to commend Chairman Jepsen, not just for convening this hearing, but for his early and continuing efforts to focus attention on the problems that are causing hardships for consumers of natural gas and his leadership in the effort to achieve legislative relief from those problems.

Before getting into the detailed analysis of current market problems and solutions, I would like to offer a few general comments. There is no question that in some parts of the country, including Iowa, natural gas prices have risen sharply, more sharply than anyone expected when the NGPA was adopted in 1978. There is a very understandable urge to affix blame for these increases. Some are blaming the NGPA, others are blaming interstate pipelines, others are blaming producers, some blame state commissions or local distribution companies, some might even blame OPEC.

The truth is, there is no one person, no one segment of the business, no one decision that can be singled out as causing today's problems. Those problems have resulted from a complex set of legislative, judicial, regulatory, and industry decisions and conditions which are inextricably interrelated and much complicated by the state of our economy. This fact was recognized just last month by the staff of the House Subcommittee on Fossil and Synthetic Fuels in its thorough review of the current gas market problem. In its January 27, 1983 transmittal memo to the Committee on Energy and Commerce, the staff noted "it is probably inappropriate to point a finger of blame at any particular party or group of interests" for these problems.

Let us all avoid pointing fingers in blame and instead, move forward constructively to solve the important problems that we have encountered.

In order to help us better understand where we are today, a brief overview of the industry structure and past events may be helpful.

OVERVIEW OF THE INTERSTATE PIPELINE INDUSTRY

Interstate pipelines are one of three major segments of the natural gas industry, the others being producers of gas and distribution companies. Interstate pipelines are commonly regarded as being the transporters of natural gas, the physical link between producers and local distribution companies. But the responsibilities of interstate pipelines go much further. Interstate pipelines operate subject to the terms and conditions of certificates issued originally by the Federal Power Commission and now by its successor, the Federal Energy Regulatory Commission.

In exchange for receiving the right to construct facilities and transport gas the pipeline assumes the responsibility to contract for sufficient reserves and to manage the flow of gas to their local distribution customers so that an adequate supply is available to meet customer needs twenty-four hours a day, seven days a week, three hundred and sixty five days a year.

Consumers need to understand that in order to fulfill this obligation, pipelines must plan years in advance. Natural gas is not a "shelf" item. A pipeline cannot wait until gas is actually needed before it goes out and buys it. On the contrary, a pipeline is expected to forecast what the demand for gas will be on its system as much as five or ten years in advance. This is particularly true if new facilities are required to attach a new source of supply.

My point is this: most of the natural gas flowing today is the result of decisions made in the 1970's and even the 1960's. When pipelines were making these decisions, it was against a backdrop of chronic shortages and tremendous pressures from consumers for additional supplies of gas. When these decisions were made, no one could foresee the passage of legislation such at the Natural Gas Policy Act and the Fuel Use Act. No one could foresee the gyrations of oil prices. No one could foresee that our nation would be suffering through the deepest recession of modern times. Thus, the problems in today's natural gas markets were not reasonably anticipated when the pipelines were making their supply decisions. Moreover, these problems have resulted largely from factors outside the control of the gas industry.

In some quarters, pipelines have been accused of being insensitive to the price of gas. INGAA takes strong exception to this notion.

It is important to realize that interstate pipelines do not make money on the buying and selling of natural gas itself. They are allowed to earn a regulated rate of return on the transportation of natural gas. This rate of return is not guaranteed by FERC. If a pipeline transports less gas than it projected in its rate filings in a given year, it will earn less than the allowed rate of return. If a pipeline secures relatively low-cost gas for its customers, the pipeline does not benefit directly from its success. All of the benefits of the low-cost gas are flowed directly through to a pipeline's customers. Conversely, the burdens of higher gas costs are flowed through as well.

Pipelines are caught in the dilemma of satisfying both their customers and their suppliers. Pipelines have both a short and a long-run interest in keeping their purchase gas costs as low as possible. First, once a rate filing is in effect, a pipeline must transport the volume of gas projected in the rate filing in order to make its allowed rate of return and stay in business; second, by optimizing the use of its system the unit cost of gas to all users is lowered; and, third, a pipeline's viability is dependent on the markets it is authorized by FERC to serve and adequate supplies to render that service. If prices rise too high, a pipeline's current and future market will decline and it will lose the opportunity to sell its transportation service. If the price of gas in the field is too low there is little incentive to explore for and develop new reserves to replace those used up. Moreover, both the physical structure of the pipeline industry and FERC regulation tend to tie pipelines to their existing markets. Thus a pipeline has strong incentives to purchase gas at reasonable prices not only to keep its product competitive with alternative fuels but to generate new supplies as well. Balancing these two critical elements of our business is a matter of great difficulty, particularly in these recessionary times.

THE IMPACT OF THE NGPA

The roots of today's market difficulties can be traced back to the Supreme Court's decision in 1954, that resulted in the imposition of wellhead price controls on natural gas purchased by interstate pipelines. Administration of these price controls proved totally unworkable and as a practical matter, the prices that interstate pipelines were allowed to pay were held far below market levels. While consumers enjoyed the benefits of cheap gas for years producers virtually stopped dedicating new reserves to the interstate market. Much of the new gas that was discovered was instead dedicated to the intrastate market where it was not subject to wellhead price controls.

The full impact of this seriously misguided policy manifested itself during the mid-1970's. Because the reserves of interstate pipelines had been drained to dangerously low levels, shortages began to appear and the service to many "low priority" customers such as industrial users, power plant users, and others was curtailed. As the record cold winter of 1976-77 swept over the nation, hundreds of factories were closed and thousands of workers were laid off because adequate supplies of gas were unavailable. Clearly, a change in Federal policy was needed and it was against this backdrop that the NGPA was considered.

The Natural Gas Policy Act of 1978 was the result of a bitter and divisive battle in the Congress over the direction of natural gas pricing policy. While it is easy to criticize the Act, it is also important to recognize that the NGPA was a substantial advance over previous policy in three important respects:

1) the NGPA eliminated the dual market for natural gas, i.e., intrastate versus interstate, that existed prior to enactment, thereby allowing surplus intrastate gas to flow into the gas-short interstate market;

2) the NGPA improved the supply situation by providing incentives for exploration and development of new gas supplies; and,

3) the NGPA clearly established wellhead decontrol as an ultimate goal of Federal policy and provided for a transition from regulation to deregulation.

The NGPA, in fact, has worked well to ease the critical supply shortages of the mid-1970's. Today, however, the country faces a different kind of problem: the problem of coping with excess natural gas deliverability and prices which are near or exceeding market clearing levels in many parts of the country. The marketing problems facing the industry today have resulted in a large part from the rigidity of NGPA pricing provisions which adjust the price of gas upward, but not downward. In addition, the shortages of the 1970's and Federally imposed price controls forced pipelines to negotiate on contract terms rather than price. These contracts, signed in a seller's market, also tend to move gas prices inexorably upward by making the price controls in the NGPA price floors rather than price ceilings. They also threaten to trigger a fly up in gas prices on 1/1/85 if the indefinite pricing clauses present in such contracts are not diffused.

CURRENT STATE OF THE NATURAL GAS MARKET

The current perception is that gas supply is in surplus yet gas prices keep rising. Observers question whether the gas market is workably competitive if gas prices do not fall during an apparent gas "glut."

On the supply side, there is a temporary excess deliverability of natural gas, i.e., there is more gas available for delivery than the market can utilize. This short-term surplus has been brought about by three factors:

1) Contracting practices changed during the gas shortages of the 1970's. Minimum deliverabilities under contracts changed from take-or-pay clauses[1/] tied to a percentage of the original recoverable reserve (over a 10 to 20 year period) to a take-or-pay clause tied to a very high percentage of daily gas deliverability. These new clauses encouraged the development of higher deliverability capacity.

2) In addition, the NGPA specifically provides incentives for faster production of existing reserves by establishing a higher price for gas from developmental wells (Section 103 gas).

[1/] A take-or-pay provision is a minimum requirement to "take" a certain volume of gas (usually expressed as a percent of remaining reserves or of current deliverability) or to pay for gas which is not taken. Usually the contract allows the buyer to receive at a later date gas which is paid for under these provisions.

3) Government policies encourage maximum production from Federal leases especially on the offshore. In the 1970's these policies were designed to help alleviate the shortage problems of interstate pipelines (since offshore gas is dedicated to interstate commerce).

These factors have led to higher-than-expected gas availability at a time when the poor performance of the economy and higher gas prices had led to lower-than-expected demand.

However, notwithstanding the improved deliverability for gas, the long-term reserve picture has not improved since 1978 when there was a widespread perception of gas shortages. In 1978, the U.S. had an 11.1 year supply of gas at 1978 production levels; in 1981, that had declined to a 10.8 year supply at 1981 production levels. Why then the discrepancy in the short-run and long-run pictures? The answer appears to be that deliverability (both the physical ability of producers to draw down reserves and the contractual obligations of pipelines to take gas quickly) has increased far more rapidly than new reserves have been found. Reserve additions in 1981 actually exceeded gas production (by 2.7 Tcf), leading some to become very optimistic about future gas supplies. But we should not forget that reserve additions have averaged only 64% of production for the last ten years and only 86% of production for the last five years. Thus, the long-term supply situation, which was a major factor in persuading Congress to vote for the price increases in the NGPA, has not changed dramatically since the passage of the Act. In considering any amendment to the NGPA, therefore, such amendment must be carefully crafted not to discourage the development of new reserves.

A major area of concern is the extent of recent price increases. Media attention has focused on rapid price increases on some pipeline systems in some parts of the country. However, according to the most recent date 2/ available from the Energy Information Administration (EIA), average domestic purchased gas costs by interstate pipelines increased by $.34/Mcf (in

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2/ See An Analysis of Post-NGPA Interstate Wellhead Pipeline Purchases, September, 1982, DOE/EIA-0357, Table I, p. 6.

January, 1982 dollars) or 17% above inflation from mid-1981 to mid-1982. This average rate of increase, however, includes a diverse set of pipeline experiences with price increases. For instance, the inflation-adjusted rate of price change for the same period ranged from a 2% decrease up to a 44% increase. The rates of increase on a pipeline-specific basis can be misleading. For example, a 50 cent increase is a 50% increase for $1.00 gas but only a 25% increase for $2.00 gas. These latest increases are significant but not markedly greater than historical rate of price changes.

A major cause of the price increase is the shift in volumes from lower-cost NGPA categories to higher-cost NGPA categories. This shift is predominantly due to the natural decline of old gas. For example, old gas volumes (Section 104/106) declined by 9% from mid-1981 to mid-1982. This decline rate is consistent with historical average rates of depletion for existing fields. During the same period, high-cost gas rose slightly in volume (from 4% of interstate purchases to 6%), but rose substantially in contribution to cost (from 12% to 20% of total gas costs). New gas (Sections 102, 103, 108, and 109) maintained their share of costs (50%) and increased slightly their share of volume (33% to 37%). A recent General Accounting Office (GAO) study for Congress has also examined the significance of the shift in the mix of NGPA categories for gas supplies. The GAO's analysis supports our point that the shift from low cost old gas to higher cost new gas supplies explains a substantial share of cost increases.

The GAO explained its analysis as follows:

> "To provide some perspective on the relative importance of prices and proportions, we compared the actual prices and quantities for 1981 with two alternatives. First, we calculated the average price of buying the 1981 volumes at the 1982 prices, to illustrate the importance of changes in price; the average price went from $2.01 to $2.10. Secondly, we calculated the average price of buying the 1982 volumes at the 1981 prices, to illustrate the importance of changes in proportions; the average price went from $2.01 to $2.22.
>
> The overall increase of $0.34 per Mcf may be compared with the 1981 quantities/1982 prices increase of $0.09 and the 1982

> quantities/1981 prices increase of $0.21. The changes in proportionate quantities appear to account for about twice as much of the overall change as the price changes. Even after the seven-percent inflation rate between the two periods is considered, the changes in proportionate quantities appear to account for at least half the overall change."1/

Some have argued that a major source of interstate price increases is a selective cut-back of old gas and increased takes of high-cost gas by interstate pipelines. The EIA data showing that old gas volumes are on average declining at a normal depletion rate demonstrate that this assertion is not supportable on an industry-wide basis.

TAKE-OR-PAY

There is, perhaps, some misunderstanding as to the role of take-or-pay clauses in recent price increases and in the deliverability problem. It should first be pointed out that take-or-pay clauses play an important function in gas contracting practices. For the producer, such clauses provide assurance of a minimum cash flow, which may be necessary to meet his financial obligations. For pipelines such clauses offer an alternative contract bargaining element to price. There is no question, however, that some companies are currently faced with severe take-or-pay problems and it is a matter of great concern to the industry.

Although there are no publicly available data on the extent to which such clauses are affecting gas prices today the EIA did complete a study last June that may shed some light on the problem. That study sampled data from several hundred producers and purchasers of natural gas in late 1981. Table 1 below, presents EIA's estimates of weighted average take-or-pay levels. These EIA results indicate that the average minimum take for high

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1/ Preliminary Analysis of Natural Gas Price Increases December 9, 1982, GAO, p. 11.

cost Section 107 gas (75.8 percent) is lower than for lower cost Section 102 gas (87.2 percent onshore, 90.4 percent offshore).

INGAA is working actively to develop facts on the extent of this problem.

Table 1

Take-or-Pay Statistical Estimates Reported by EIA 1/

NGPA Section	Weighted Average Percent Take Requirement
102 Onshore	87.2%
102 Offshore	90.4
103	80.1
107	75.8
108	97.8
105/106(b)	75.9
104/106(a)	92.0 2/
Vintage 3/	
Pre-1973	78.1%
1973-4/20/77	94.0
4/21/77-11/8/78	88.0
11/9/78-79	86.8
1980	79.0

1/ DOE/EIA, Natural Gas Producer/Purchaser Contracts and Their Potential Impacts on the Natural Gas Market, June 1982, p. 41. The estimates are based on a statistical sample taken by EIA.

2/ Data on 104 and 106(b) are not based on the Form EIA-758 data but on the study published in December 1981. INGAA believes that the mathematical interpretation applied to reserve- based minimum takes exaggerates the take requirements for 104/106(a) gas in particular and also for other older gas supplies. The reserve- based clauses are typically less stringent than deliverability-based minimum takes, but EIA interpreted the reserve-based clauses as 100 percent minimum takes.

3/ These data on vintage do not include Section 104 and 106(a) data.

While INGAA believes that any legislative solution to the current market distortions should address the take-or-pay issue, addressing take-or-pay alone would not, in our judgment, correct the serious problems we foresee and may not significantly benefit most consumers.

A LEGISLATIVE SOLUTION IS NEEDED

The industry has not been idle in the face of these market distortions. The signals from the marketplace have been loud and clear. Today, most, if not all, companies, including those serving Iowa, are negotiating in earnest with gas producers to revise contract provisions concerning take-or-pay levels and prices. There are thousands of gas supply contracts and progress is likely to be steady but slow. However, one sign of the commitment of the gas pipeline industry to controlling prices is the extent to which pipelines have exercised market outs. At least nine pipelines have exercised market outs between the spring of 1982 and today. FERC Chairman Butler recently reported that estimates of the annual savings from market outs approach three-quarters of a billion dollars.[1] Other important pipeline actions include rate decrease filings; filings to reduce industrial gas prices to maintain industrial user contributions to the fixed costs of pipeline systems, and Section 102 gas purchases at prices below the Section 102 ceilings. We expect that the spring 1983 PGA filings will show evidence of the stronger bargaining position in which domestic gas buyers now find themselves, but these results lag the point when excess deliverability first became serious by about one year.

Some have suggested that the FERC address these problems under its existing authority. However, the FERC's authority to modify or abrogate indefinite price escalator clauses, or take-or-pay clauses, or to insert market out clauses in existing contracts is highly debatable and subject to lengthy court challenge. Legislation, in our view, is sorely needed.

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[1] C. M. Butler, Chairman, FERC, letter to Honorable Philip R. Sharp, Chairman, Subcommittee on Fossil and Synthetic Fuels, January 27, 1983, p. 3. It should be noted, however, that many contracts do not have market outs.

The primary purpose of such legislation should be threefold: to untangle the intricate and rigid web of price controls and other contract provisions which today are causing serious distortions in the market place; to address the multifaceted contract problems which beset the industry and which, if left uncorrected, will continue to have a serious impact on consumers; and to insure against increasing the cost of natural gas to consumers without destroying at the same time the incentives needed to explore for and develop new reserves of this vital fuel.

Because the problem of increasing gas costs rests primarily with the existing regulatory-contractual regime, proposals that would place undue restrictions on the recovery by pipelines of their purchased gas costs are misdirected. Such an approach would do little to resolve current market problems. On the contrary, such proposals could greatly exacerbate current difficulties by creating a regulatory nightmare. The very solvency of the pipeline industry could be threatened if companies had to wait months, perhaps even years, to learn if they could recover the cost of purchased gas, costs which routinely involve huge sums. No business in this country is expected to operate in a climate of such regulatory uncertainty. In fashioning legislative solutions, therefore, it is paramount that we maintain a healthy industry so that all segments are better able to serve the public. To this end we are anxious to work with the Congress in arriving at some rational package that will achieve this result.

While INGAA's approach to legislation may differ somewhat from that of the Chairman's, we have reviewed with great interest your bill, S. 239. In many respects it is similar to INGAA's own position. For example, S. 239 would seek to limit take-or-pay clauses in producer-pipeline contracts to 70% of daily contract quantity. INGAA believes that a rollback of take-or-pay levels to 60% of deliverability, for a three year period is desirable. Your bill would seek to restrict the use of indefinite price escalator clauses. It is INGAA's position that such clauses should be capped to an appropriate indicator of market clearing gas prices that would allow prices to fall if market conditions warrant. S. 239 would also seek to restrict the use of so-called third party favored nation clauses. INGAA's position is to apply a price cap to such clauses in existing contracts, and we are now considering that question regarding future contracts. Finally, S. 239 would seek to encourge the inclusion of market out clauses in gas purchase contracts. INGAA believes that such clauses should be inserted into Section 107 gas contracts, the highest priced gas.

INGAA, however, would differ from the approach of S. 239 in reaching these goals. S. 239 would impose these standards at the regulatory level, in proceedings regarding the recovery of purchased gas costs by pipelines. We believe a more effective approach is to set legislative standards that would make such changes mandatory. The regulatory process is already a slow and cumbersome one. We believe that the delay and litigation that would result from further increasing and complicating the process would not achieve relief for consumers in a timely fashion. On the other hand, consumers could benefit almost immediately if the current inflexible contractual regime is addressed directly.

We would be pleased, of course, to work with you and your staff, Mr. Chairman, on these and other legislative proposals of importance. It is critical, in our view, that the Administration and the Congress come up with a comprehensive bill this year. If we fail in that effort consumers, the industry and the public at large will have been seriously disserved.

I appreciate the opportunity to appear here today and would be pleased to respond to any questions you may have.

Senator **Jepsen**. Thank you, Mr. McGrath.

I would like to introduce on my right John Conrad of my Senate staff, whose staff responsibilities include the area of natural gas problems, and on my left, Chris Frenze, who is the economist from the Joint Economic Committee and has as part of his responsibility the problems in the natural gas area. These two gentlemen will assist in providing information and may also at times ask some questions.

I thank the three panel members for their candid and well-thought out, detailed prepared statements. They will add considerably to the record. I will make both my comments and questions brief and to the point.

My bill, on which hearings have been held, was to get at the problem on the quickest possible basis. Parenthetically, I would point out that under Government controls the price of gas started at 27 cents at the pumps, and by the time they took off the controls it was a dollar and a half. And if that's control of the price of gasoline, then I think we may not be helped much by that type of procedure.

That's not typical of what happens when the Government gets involved and tries to regulate something. The problem with the Natural Gas Policy Act is the increase in natural gas rates which has become the center of the controversy here. Some in the industry I think, and I say this constructively, may be using the Natural Gas Policy Act of 1978 as a sort of an excuse to just keep things going a little bit longer, to maybe "get while the getting is good" before conditions change.

There are aspects of this Natural Gas Policy Act which encourage higher gas prices. In this regard, one of the things that I would like Mr. Bush to comment on is that there is what is called most favored nation clauses. You know what I mean. That's where the purchase price paid by any pipeline to a producer is set by the highest price in a particular area. If, for instance, the incentive is there and they, in fact, have dug 15,000 feet and found natural gas in an area where there are already producing wells that are 7,000 feet; then is that the price paid for the natural gas from that whole area, determined by the price and the cost that it has experienced?

Mr. **Bush**. Senator, if you look at the Deep Gas Section 107, gas is specifically prohibited from those law clauses. But your point is still exactly right regardless of what you attributed it to—the section 107 gas. You are driving at what in the heart is an excellent point. May I comment on that?

Senator **Jepsen**. I wish you would. I understand that the most favored nation clause—and also the highest legal price clause—simply says that we take the most expensive gas in the area and set the price for the rest of the gas regardless of whether the other folks, the other wells, wanted to sell it or not.

Mr. **Bush**. The Congress in passing the Natural Gas Policy Act almost forecast what could happen with deep gas prices in section 107 as they did with a number of other things, and I think they addressed that by prohibiting, but I would still like to address what your question really gets to and that is the market-clearing price at the wellhead for gas because it's very much relevant to what you just said.

The gas industry is fairly complex, and it's a little bit different than making basketballs and donuts in this sense, and Mr. McGrath alluded to it in the sense that a pipeline when it was building its large systems needed to make heavy investments, and go to the bank and borrow the money and amortize that money over 20 or 30 years, and the bank of course would logically ask the question, "Well, how can you tell me you are going to be in the business 5 or 10 years from now?" and the pipeline would necessarily say, "Well, I have a contract here which tells me that this producer is willing to sell me this gas for 20 or 30 years at a given rate." Well, for a producer to be able to say to a pipeline, "I'm willing to sell you gas for 20 or 30 years," who in the world would know in 20 or 30 years what the price of gas would be worth, or the price of basketballs, or any commodity. If you were to guarantee to somebody that you were going to sell them something 20 years from now, how would you ever arrive at what the price would be?

What came about was an umbrella group of things called indefinite price escalators, and they have area rate clauses, they have all kinds of things, but one of those is called the most-favored-nations clause that you have described. and that basically says there is a clause in the contract that says, "OK, I don't know what the price is going to be 10 or 15 years from now, but the price I get for my gas should be whatever the price is paid for on the market at that time." In other words, "What new gas is getting in that area by a pipeline buyer, when he determines what the value of that gas is worth, my gas ought to be worth that much, too, because it's the same commodity."

The only reason it gets to be a problem is because, as you have correctly identified, as long as the commodity is being priced equally, that's all right. But when you get these weird categories, these big derivations in price, where forever-regulated gas can maintain somewhat of a 70-percent supply to some pipeline, allowing him to bid up the price of new gas over what would be a market-clearing level, then you have the potential of that triggering all those other contracts.

Now, basically, in our negotiations or our discussions on this issue with Congress and with others, we've said that there ought to be a way to diffuse those indefinite price escalators in 1985. There ought to be a comprehensive approach to the problem if it would come up in 1985 when a number of these clauses would be triggered. With the partial decontrol the fear is when all those contracts tie up, so to speak. We've said that ought to be diffused as part of the commodity package, but it ought to be diffused with some equity across the board so you get an even price that people can pay. I hope that's not as confusing as it sounded to me as I listened to it.

Mr. McGRATH. As to what Mr. Bush has said, the most favored nations clauses are not a problem today, as he correctly pointed out. Your section 107 gas, your deregulated gas, is specifically prohibited by the statute from having those kinds of clauses exercised. The problem now lies ahead in January 1, 1985, when, under the terms of the NGPA, new gas as defined in that act will be deregulated and the contracts in those categories of gas have what we call indefinite price escalator clauses, which includes the most favored nations clause, which, absent some statutory capping mechanism or something to diffuse those clouds would trigger the price of natural gas up to what we believe would be very unreasonable levels.

So, part of our legislative proposal that we have urged upon the Congress is to establish a mechanism which will diffuse those clouds.

Mr. MEANS. Mr. Chairman, could I comment briefly?

Senator JEPSEN. Please.

Mr. MEANS. I think as perhaps comes from Mr. Bush's questions, there really are two different problems, the one which is a problem of 1985 and is associated with those most favored nations clauses. Today's problem is not created by the most favored nations clauses. Most of the contracts contain a number of different clauses, one of which will be a clause allowing the producers to get at least the maximum lawful price, and he would get that price no matter what other prices were being negotiated in his area. What has changed over the past year is that that clause alone, with the increasing price ceilings on one hand, and declining world oil prices on the other hand, has brought us to market-clearing prices without even getting to 1985 and the decontrol to which Mr. McGrath alluded.

The most favored nations clauses are potentially useful clauses if they were drafted so that the price can go down with new field prices as well as up. Indeed we would be much better off today if gas was governed by most favored nation clauses that could go down in the current soft market as well as up in a tight market. The problem currently is that the price is being determined by contract clauses that have nothing to do with any price being negotiated anywhere, any time, but are referenced only to the price ceiling economically, as you say, and very rigidly established by the Natural Gas Policy Act.

Senator JEPSEN. We have about 10 more minutes here. Can you tell me what the mix of policies would be that would benefit the consumers most in the long run?

Now, what is the mix? What could be done quickly to get to the point where the marketplace provides and governs the price of natural gas more accurately?

Mr. MCGRATH. Mr. Chairman, we have for some time felt that ultimately we should and must get to a decontrolled environment. Unfortunately, the connotation of decontrol is a very adverse one in the minds of many people and it's understandable that it would be, but we think that unless you eventually get to a decontrolled market at the wellhead, that you are still going to have the distortions, the problems that beset all of us today.

Now, how do you get there? We feel that it has to be a gradual transition to a decontrolled environment over time, and we think that the NGPA is a major barrier to achieving those goals in its present form. We would address it in this fashion. In addition to the provisions that are set forth in your bill, S. 139, which we have reviewed and found that——

Senator JEPSEN. S. 239.

Mr. MCGRATH. S. 239, excuse me, very close to ours in many respects dealing with take-or-pay, with the indefinite price escalators and so forth. We feel that new gas, as we would define it, should be decontrolled. That would be gas that's newly discovered under new contracts after a date—say, date of enactment which would then do the one thing on one side, create the incentive for the exploration and development for new gas reserves.

I might digress here by saying that at this time because of the economic situation, drilling is not only down to very, very low levels, but there are very few interstate pipelines now buying gas, and for the future I don't think that portends very well because we are using up the gas each day that we sell, gas to the homeowner and to the industries. That has to be replaced if we are going to continue in business so that to the extent that the drilling isn't going on we are not supplying gas. We think in the long run this is going to be very harmful, so we think one major step would be to open up the drilling for new gas, and we sincerely believe that the pricing will reflect the market conditions of the day.

We would phase up the date of decontrol for section 102 and 103 gas, your new gas, from 1985 to 1984 with a price capping mechanism to prevent the escalator clauses that you were describing earlier in questioning from being triggered, and it would also have the effect, we believe, of preventing the statutory increases, the inflation plus 4 percent automatic adjustments that are now in the act from occurring in 1984 and so on until such time as the contracts are renegotiated or terminated and those indefinite pricing contracts are eliminated.

Senator JEPSEN. Now——

Mr. BUSH. Can I comment on that, or do you want——

Senator JEPSEN. Yes, I would like that. I don't know how everyone else is doing with the numbers and the laws and the regulations, but I gather from the testimony given here that we're buying and paying $4.94 for Canadian gas, Algerian gas is $7, someone else's is $10, while much of our gas is sitting here in this country at about $2 and something. Now, just kind of keeping those figures in mind, how come we aren't using our own gas and the consumers aren't paying that price that's based on the $2 range instead of the $5, the $7, or the $10 range?

Mr. MCGRATH. Well, if you didn't take the gas from Canada, for example, the Pacific Northwest wouldn't have gas. All of its gas comes from Canada. In the Midwest there is a good bit of Canadian gas coming in that's needed. If you take your supply projections, looking down the road, we will need every bit of energy we can find in this country and in Canada.

The LNG is another story. That's a situation that unfortunately has developed, but it is felt to be needed by the systems that have imported that gas. Now the Canadian border price of $4.94 was established by the Canadian Government and the U.S. Government in negotiations a few years ago, which we believe was most unfortunate. The Canadians in their spirit of nationalization, I guess, felt that they were going to get whatever the market would bear in their mind. It was $4.94.

Negotiations, I understand—maybe that's not the right term to use—but discussions at least, are either in progress or about to be, between the U.S. Government and the Canadian Government for a reduction in those border prices. But the Canadian gas today, and looking down the road, is going to be a very important contributor to U.S. supply.

Senator JEPSEN. What can we do about the high prices of foreign gas? And the second part of the question, is it a fact that we have gas that's capped in this country that we are not using at the same time we're buying all this——

Mr. McGRATH. There could be some. I don't think there is too much in the Southwest. There may be some in the Appalachian area, yes. There is some. But again, we are going to the commitments that were made, not only on this side of the border, but on the other side for faults that have to be paid for in some fashion.

Senator JEPSEN. Is it the industry's view that they are doing the country a service and so on by securing gas for, conceivably, the next quarter century, or half century. I'm asking that very constructively. What is the industry's reason for taking the foreign gas and paying the high prices when we have lower-priced gas not being used right here in our own country? Just if you can in a one-liner or two.

Mr. McGRATH. Well, it's difficult to explain in a one-liner. It is a contractual commitment of long standing to acquire reserves to meet the needs of the various market areas. As I mentioned, for example, the Pacific Northwest is supplied almost entirely by Canadian gas. The Midwestern States take much less Canadian gas. Now, to the extent that more expensive gas may be taken on some systems proportionately to your lower cost is because of the commitments under the contracts to pay for that gas if they don't take it, and those are the take-or-pay clauses that we are now seeking to renegotiate, and we've been reasonably successful in the last several months. You get some of those high takes reduced which will relieve the pipelines of the obligation to take the higher-cost gas so that you could have a greater mix of your lower-cost gas.

Senator JEPSEN. Now, Mr. Bush, you represent the gas producers in this country. What's your thought on that?

Mr. BUSH. I thought you would never ask. I have to disassociate myself a little bit from some of the remarks, and when you used the word industry, I assumed you were talking about the pipeline industry and not the producing industry, because we have a very different way of looking at things.

Simply put, there are a couple things that are necessary to understand. One is that one of the items that Mr. McGrath left out of the formula that he gave on how he would approach decontrol is the famous bugaboo of that forever-regulated, so-called old gas, section 104 gas. As you correctly alluded to, the more you get into this the more you see people trying to protect self-interest. You can see in some cases—well, you know I have constituents. I have producers who have produced section 107 deep gas, and they kind of like the way things go when you get $8 an Mcf, and they probably aren't happy to hear me talking about destabilizing price by decontrolling.

The key element is that, the Pacific Northwest notwithstanding, the cost of gas is a problem that's growing in Iowa and the Midwest, and there is no reason it should. The only reason it is is because the pipeline that supplies this State and this area, Northern Natural, is a heavy-cushioned pipeline. If I'm not mistaken, 70 percent of its supplies are made up of forever-regulated domestic gas held well below whatever would be a market price, giving them the incentive to go seek future supplies from Canada at $4.94.

Now, we have been in all kinds of negotiations with Canada, but if I were the Canadians, I would tell us to go shove it. Why should they lower their prices when we are so absurd as to not even straighten out the mess we have in this country with domestic gas prices? It isn't a price that they thought this market could bear; it's a price that we were willing to pay.

Pipelines buy that gas for $4.94 Mcf and then talk about how wrong it is for a producer that has gas that he's selling and could sell at 50 cents to be able to get $1.50 or $2. There could be domestic reserve. This country is rich in natural gas reserves, 900 trillion cubic feet, by some estimates, of domestic gas reserves that can be brought forward. The only thing that we're lacking is an efficient and logical policy to bring it forward. We pursue policies that encourage people to buy gas at $4.94 and $7 and roll these prices in.

Senator **Jepsen**. Who is "we"?

Mr. **Bush**. Well, the Natural Gas Policy Act.

Mr. **McGrath**. Mr. Bush's bleeding heart gets to me, but the producers are the ones that pay for the pipelines. "This is what we will sell you the gas for, either buy it or we will sell it to somebody else." Comments about the pipelines are terribly misleading to you, Mr. Chairman, and to the people of Iowa and everyone.

Mr. **Means**. Mr. Chairman, could I comment on the imported gas for a moment? The problem is this consists of three parts. One is the price, which is clearly too high. Discussions are now going on and the consumers are extremely sensitive about it. As a practical matter, I think Mr. Bush is correct. Unless we revise our own pricing so that there is not domestic price setting governing the border price, it will be very difficult to renegotiate the Canadian prices down. Nevertheless, discussions are going forward. Potentially, Canadian gas is probably the cheapest source of supply for much of the Midwest, the Northwest, and when they are renegotiated down, the Northeast.

Senator **Jepsen**. Excuse me for interrupting, but I don't fully understand. You said that the Northwestern part of the country potentially is going to have the best deal from Canada? What do you mean?

Mr. **Means**. If the Canadian price is brought down to reasonable levels, the fact that the Canadian reserves are simply closer to these markets than the southwestern gas, but this assumes that the price is renegotiated down. At the moment it is not a good deal except in very narrow boundaries.

Senator **Jepsen**. So the reason for sale is because of the logic involved with the geography of the nearness of the supply?

Mr. **Means**. That is correct.

Senator **Jepsen**. But they have to reduce the price.

Mr. **Means**. The price must be reduced, I think, in some way or another. It will be greatly facilitated by reducing our own prices so that they would no longer be able to point to a limited amount of U.S. domestic gas.

Senator **Jepsen**. You mean they point to this gas act of 1978, too?

Mr. **Means**. Yes; they point to the tight sands price that we've established that we are in the process of reviewing, and they point to the deregulated gas price.

Senator **Jepsen**. I was just trying to make a point.

Mr. **Means**. Your point is a fair one. People are using it as an excuse for not acting, but I think in the negotiations it will be easier to negotiate when we can say: "You are alone up there at $4.94."

The second and third points concern supply. At the moment, I believe indirectly the pipelines are taking, in general, the minimum amount that they are contractually obligated to take under the contracts on the Canadian imports. That is for the present. The reason that the pipelines are going forth with plans for additional imports for the latter part of this decade is that there is some prospect of a supply decline from domestic sources. The contracts make sense, but only if they are negotiated at a price which is a price that makes sense in terms of the United States.

Senator JEPSEN. Why, in your opinion, did those pipelines sign such open-ended commitments to buy very expensive gas?

Mr. MEANS. Your point earlier was precisely correct, I think, about the Natural Gas Policy Act and these contracts.

Senator JEPSEN. I asked for your opinion, not my point. Why do you think they did that?

Mr. MEANS. Two reasons. They were integrated. One, I think none of us, including myself, ever foresaw times when you could not market all the gas you could lay your hands on. The second was that, as Mr. Bush has pointed out, because they didn't look forward to paying the high prices because they were relying on their cushions.

Senator JEPSEN. Mr. McGrath, why do you think that your pipelines did that? Same reason?

Mr. MCGRATH. Let me say that it's not an open-ended agreement, and I go back to the time when most of the contracts that are the basis of supply today were entered into. That was around the early and middle 1970's and up to today, where there was a severe shortage of natural gas. There was a seller's market. The pipelines were running out of gas. And, whenever they could get gas, they signed a contract for supply to start building up their reserve again, and, as Mr. Bush had pointed out and I alluded to earlier, when a producer sells gas to a pipeline that is going to be used many years later, and having the Natural Gas Policy Act in place which establishes by law a maximum lawful price, that the seller is putting provisions in the contract that he is entitled to receive that maximum lawful price, and it's the operation of those contracts and the escalators in the law which automatically increase the cost as time goes on.

Now, in the Canadian supply that goes back to many, many years of supply arrangements also, but as I mentioned earlier, the decision to establish the border price was not of our making or that of the United States; it was the Canadian Government that established that price, and it's now hopefully where the Governments will get together and see the light of day and put it down to reality.

Senator JEPSEN. Governments?

Mr. MCGRATH. We understand the price was set, not to the pipelines negotiating with the producers in Canada; the price was established through Government-to-Government negotiations through the U.S. State Department and the Canadians.

Senator JEPSEN. A couple of quick questions, then we're going to assemble the next panel. You can tell when we get all parties involved, we do get constructive discussions. How much have producers' profits risen in the last year, Mr. Bush?

Mr. BUSH. They have fallen. I think they are about $4 million. The combined profits of the top 25 companies that basically produce all gas have had falling profits, largely attributable, I will quickly add, to the rapid decline in oil prices, not necessarily attributable to gas price. But again, to be perfectly candid, even while some companies may—their total profits are down, gas revenues are down, in many cases they are not split out, but I will tell you there are an awful lot of independent producers who, like farmers, are in a depression, not in a recession.

Senator **Jepsen**. Let's expand that to 2 years. How have they done in the last 2 years, and what has been their return on investment?

Mr. **Bush**. If you take the past 10 years, if you measure by shareholder's equity, if you measure it by return on assets, the top 25 companies, again, oil and gas companies, were, I think, 6 out of the 10 years were below—I'd rather want to be exact, and I would submit the exact numbers for the record, and by and large their return on assets, their return on shareholder's equity is right about the same which happens for all manufacturing. The reason, Senator, that people have a hard time believing that is because of the size of the revenues generated, but the costs are just as huge.

Senator **Jepsen**. In the last 2 years, that's when the price has been skyrocketed.

Mr. **Bush**. When OPEC prices fell and when we decontrolled oil and we put heavy pressure and really cracked OPEC and brought the price of oil down, there has been much lower oil prices, and as a result profits have gone down. But that's not bad because costs are going down.

Senator **Jepsen**. Constructively, I'm used to dealing with Washington, and it's hard to get an answer there—in the 2-year period of investment return we're talking about, a time when those of us out here on the ranch and on the firing line have experienced this rapid increase, how have profits been over those last 2 years?

Mr. **Bush**. The industry profited in 1981.

Senator **Jepsen**. Just generally, has it been above average, average, or below average?

Mr. **Bush**. Four percent above—compared to total manufacturers—for the past 3 years; and below for the prior 3 years. Above for the prior 2 years to that; and below for the other years. It's just not that different.

Senator **Jepsen**. Mr. McGrath, how are the pipelines doing in the last couple years?

Mr. **McGrath**. As you know, Senator, their return is regulated by the Federal Energy Regulatory Commission, and established after hearing and consideration by the Commission of the rate structure, and we make no money on the sale of natural gas itself as a commodity. Our return is based upon the investment and the transportation of the gas. I would say in the last couple of years they have been kind of flat. Now, to the extent that the parent company, for example, might have different operations, different businesses, maybe the parent profits may be up or down, but generally as far as the transmission companies, either down or flat.

Senator **Jepsen**. As you know, I'm an advocate of profit, and I am also an advocate of the private sector. However, last night on the networks there was a story about Panhandle Gas Co. You probably know the one I'm referring to.

Mr. **McGrath**. Panhandle Eastern Pipeline.

Senator **Jepsen**. OK. I just get pieces; that's what a lot of people do. Panhandle Eastern, anyway, was spending $1 million to build a country club for its employees and all this money a year for the maintenance, and it would appear this facility would have been a luxurious club to belong to. Panhandle has asked for a rate increase. You put all these things together in these times, and I can't blame people for ringing my phone off the wall and saying: "What's the matter?" What do we do?

Mr. **McGrath**. Well, I didn't hear the details of the story you mentioned. I did hear about it this morning, and I don't know the facts. It's my understanding that that facility was on land owned by the pipeline company for many, many years, and it's out in Kansas, and it is basically an overall employee recreation center that was put up for the benefit of the employees, the union-nonunion employees, and the retired company people. It does have a golf course, I understand.

Senator **Jepsen**. I don't expect you to have to explain something in detail, nor is the detail particularly the issue. I mean, companies build things for the employees and that's applauded all the time, but it's the way that his example was presented and the way that the public sees it.

Mr. **McGrath**. Yes, I can understand this.

Senator **Jepsen**. And the question that is logical to ask is: "How come prices are going to continue to go up? Is this fair this is happening?" And getting off of this theme to a more general one, one we know best about in Iowa, I think about 1 year ago this time when Northern Natural announced projected increases of somewhere in the neighborhood of 33 percent, and 2 days later announced $400 million profits, its highest profit in American history. You put those two things together and what are the folks supposed to believe?

Mr. **McGrath**. Again, I go to the point you made earlier on Northern Natural, for example. InterNorth is a major diversified company. I'm not familiar with it's nonpipeline business. I do know that their pipelines which I represent are controlled by FERC. How much that contributes to their total profit I don't know. But let me make a comment to the gas prices; 10 years ago, for example, the purchase gas cost component of a pipeline's rate was about 17 percent. In other words, 17 cents out of every dollar was for purchased gas. Today the numbers are about 80 percent to John Daniel's company, Iowa-Illinois, for example, and he may have more exact figures, but it's in that neighborhood. The purchased gas cost, that is, your wellhead cost of gas comprises about 80 percent or 80 cents out of that dollar. And that's where you are seeing the increases in the cost to the consumers.

Now, it's a combination of a lot of factors which we have been talking about today, but I think one thing that has to be kept in mind is that we started from a very, very low base on natural gas. It's the reason we are running out. Twenty to 25 cents in the field where it just didn't make any sense in the fields for a producer, for an entrepreneur to go out and to commit himself to millions of dollars to drill a well when his price could be regulated as it was at 20 to 25 cents per thousand cubic feet. That gas was the biggest buy, the biggest bargain in the country and it is today. Natural gas today in this country is considerably below the price of oil in many areas. Now we're seeing that gap close rather quickly.

Senator JEPSEN. Dramatically.

Mr. MCGRATH. Due to the sudden drop in the price of oil, and unfortunately, what goes on in the Middle East and OPEC and Saudi Arabia could have a very serious impact on our own lives and on the price that we pay for energy.

We've conveyed to you it is a very complex problem. It has a lot of areas in it where areas of judgment have been made. We are not certain we have made the wisest moves, but we have provided services, and have natural gas now to serve our customers; whereas in 1977-78, we were on a very steep decline, one where we were running out of gas.

Senator JEPSEN. Well, I thank the three of you. We could continue here. The Natural Gas Policy Act has permitted gas prices to increase. It's only fair that it change; that it be fair to permit the price to decrease. That, I guess, we all agree on.

We all agreed also that—not that we necessarily have to agree, but for the record here to capsulize this, that the Natural Gas Policy Act does not prohibit, for the most part, activities by parties to a contract of sitting down and renegotiating contracts. That, however, is somewhat complicated because of the involvement of foreign agreements that have been made both from our neighbors to the north and to the south, and we didn't talk a lot about Mexico. But we all agree that natural gas prices are not really reflecting what at the present the law of supply and demand would dictate in the marketplace, and so anything and everything that can be done, for everyone to lock arms and work together to get at this problem now, is what we are attempting to do.

Certainly my proposed legislation is not perfect by any means, but it certainly was something that we could move to give to FERC, to make some things in the industry work better.

For a few minutes there the thought occurred to me that producer and pipeline people could be in cahoots, but it didn't sound that way a time or two this morning. [Laughter.] I just say that in a light vein because that's the impression that some people have. But that isn't necessarily true, as the old axiom states: "We can shed some light on things if we sit down and reason together and get the facts laid out before us." All Americans really want to make the American system work, and I'll tell you there isn't any system anywhere in the world that's like it, and it's up to us to make it work. I'm encouraged and optimistic. Thank you very much.

I hope you will be able to stay and hear our next panel also because that's part of the reason we got everything together. Thank you very much.

We will take about a 3 minute break while we change panels and name signs and give our reporter over here a time to rest her fingers.

[A short recess was taken.]

Senator JEPSEN. On this next panel we welcome Christine Hansen from the Iowa Commerce Commission, Dean Kleckner from the Iowa Farm Bureau Federation, John Daniel, Iowa-Illinois Gas & Electric, and Linda Blanchard from Cedar Rapids, who as I understand, is president of the Citizens for Community Improvement, and Gordon Dunn, vice president. Constance Berka and Opal Morrow are from United Neighbors. Again, I would respectfully advise the panel that we tried to have a 10-minute limit on statements. You see how easily that escapes and gets away from us. We hope that you will consolidate and summarize your prepared statements so that we can have more time for questions and exchanges. The written remarks that have been submitted by all of the panel members will be entered into the record as if read, and, therefore, as we move now among the panel members you can proceed to summarize your remarks as you see fit.

We started our last panel with the representative of the Federal Energy Regulatory Commission, and I would prefer, if we may, to start out with the Iowa Commerce Commission representative to kind of set the stage and work from there this time. Christine Hansen, you may proceed.

STATEMENT OF CHRISTINE A. HANSEN, COMMISSIONER, IOWA STATE COMMERCE COMMISSION, DAVENPORT, IOWA

Ms. HANSEN. Thank you, Senator Jepsen. I want to thank you for bringing this here to Iowa, and I want to thank you for your continued support for the efforts of the Iowa Commerce Commission in the natural gas area. You have worked with us the last couple years; John Conrad, of your staff, has been very cooperative and mostly unsung because natural gas wasn't the issue on everyone's lips until recently. So we appreciate your long-standing efforts in this area and the continued assistance of your staff.

The Iowa Commerce Commission has a couple of primary points we would like to make. One is that we think the industry could be working to solve this problem themselves and they are clearly not going to. And the other is we have some great concern for the continued financial viability of local distribution companies as the natural gas market changes as rapidly as it is.

The heating season, as you know, Senator, in the upper Midwest is bitter, and the feelings of Iowans on the subject of natural gas have also been genuinely bitter. The natural gas consumers in this State, both the large volume consumers and the small volume consumers, are getting so bitter about the price of gas that they are doing quite a bit about it. The cause of this bitterness is simply that natural gas has reached its market-clearing price in Iowa. You have heard here already this morning that there is a feeling that gas has reached its market-clearing price on some systems. I submit that gas has reached its market-clearing price on all of the Iowa pipeline systems. While I recognize that we get a price of gas that is considerably below some in other parts of the country, even our relatively low-priced gas is above the market-clearing price, and the public is bitter because the market is not able to respond to the fact that they have passed the market-clearing price. The Federal Government must respond quickly to correct these errors because nobody else is going to do it.

There is a continuing misconception in the natural gas industries that prices have some room to move upward. Our major supplier, Northern Natural Gas Pipeline, which is not the supplier here in the Quad Cities area, but it's a major supplier in Iowa, has recently predicted that we will see no large increases from them in 1983 and 1984. That company estimates an increase in both of those years at a level about 10 percent above inflation. Such an increase will not be tolerated by the present market. Such an increase is absolutely not a response to the present market.

The natural gas industry also fosters the misconception that what we are experiencing is a temporary surplus, and former levels of consumption will make the surplus vanish as soon as we have an economic recovery. That is nonsense.

The Iowa Commerce Commission has developed a natural gas task force which researches natural gas topics of importance, and I have included a copy of their report from last year. It contains some of the most statistically solid results of natural gas pricing and price reaction that are available nationally. The Iowa Commerce Commission regulates six investor-owned gas and electric utilities, five gas-only utilities. Iowa is serviced by 24 gas and electric municipal utilities and 17 gas-only municipals. The commission is charged only with assuring adequate service provided by the municipals. We do not regulate the rates of those municipals. In all, we regulate 412 utilities in Iowa, and in addition, we regulated more than a thousand grain dealers and grain warehouses.

By far our greatest volume of complaints for all that regulatory authority stems from the price of natural gas. The commission has been as frustrated as the average consumer concerning natural gas rates, and we have tried to do something about it through cooperating with your office in helping with legislation, through communicating with our congressional delegation. We have moved one of our attorneys, as you know, to Washington, D.C., full time, and we are one of three States in the Nation that intervenes full time for the Federal Energy Regulatory Commission. The other States are New York and California.

However, prices are still too high. More than 80 percent of the residential natural gas bill of the typical Iowa consumer is set in Washington, D.C. The Commerce Commission thus has about 20 percent—and that amount is declining rapidly—of the price that we can regulate in Iowa. That price reflects primarily fixed costs of the system of the distribution company that are difficult to cut.

Not surprisingly for you, Senator, who know Iowa consumers quite well, the consumers have been providing most of their own relief to the problem. I have some charts here [indicating] that show the Iowa-Illinois system and the price reaction. Here is the price of natural gas on the Iowa-Illinois system corrected for inflation, 1979 through 1981. This is a consumer reaction to that price. That's what consumers did by 1981; that's how much natural gas the average household was using compared to what it used in 1969.

Senator Jepsen. I would like to ask, if you have no objection, if you could make these charts part of the record?

Ms. Hansen. Certainly. I would be glad to do that. I also have, attached to my prepared statement, a breakdown of my comments that reflects the total natural gas consumption and conservation in the State of Iowa. In 1970, total sales in Iowa were more than 307 million Mcf, with company total revenue of more than $176 million. By 1981 we saw a substantial drop in total sales to 27 million Mcf, but an accompanying astronomical jump in total revenue to $731 million; $176 million to $731 million, with that kind of a drop in consumption during a period when 100,000 customers were added to the natural gas system in this State.

I predict that Iowans are going to continue to react to the increased natural gas price in the same way. A fact which I have not seen well documented outside of Iowa is that our residential customers have just as much price elasticity as our industrial customers. When an industrial customer goes off the system it's one big jump downward. Residential customers are reacting in exactly the same way to the price as industrial customers.

In Iowa the marketing problems resulting from natural gas price reaction are particularly noteworthy in the industrial and the residential sectors, but the commercial sector, the small business sector, in the last year has been playing a very fast catchup. Their total consumption was down 5.3 percent in this State in the last year, and commercial sales were down 16 percent. Now, that is not all due to the economic problems, as some people in the gas industry would like us to believe. We also have shut down some large plants using great quantities of natural gas in the production process, such as farm fertilizer producers. Some of those plants are never going to come back on line in the State. They are never going to be able to produce anhydrous ammonia at a price that's competitive. In other Iowa industries we've witnessed loss of large loads due in part to the incremental pricing, which encouraged fuel switching to both coal and fuel oil. The primary fuel switch going on in the State is to coal and fuel oil, but now we are seeing some switching to electricity.

On the residential and commercial side, natural gas usage has been cut primarily through energy conservation, though there certainly is some fuel switching on the residential side as well. What we are creating at lightning speed is a natural gas distribution system which has extreme weather sensitivity. That is, residents, industrials, and commercials might heat with kerosene space heaters, process heat, and electric heat pumps until the temperature dips below 20 degrees, and then they will all switch to gas heat, creating very uneven load and volume demands even the best of weather forecasters could not plan for.

There is no question that we were an energy-wasteful country when natural gas was so cheap, and this was particularly true because it was an underpriced commodity. In Iowa we are beginning to correct patterns of waste with vigor, as Iowans always do. Continued mispricing of natural gas will only speed the current pace of changed usage patterns, and will ultimately result in ruining the natural gas market. The fact is that we are not going to return to the good old days of low pricing, and we are not going to return to the good old days of sales at the level that they were. Thank you, Senator.

[The prepared statement of Ms. Hansen, together with appendixes, a report, exhibits, and an attachment, follows:]

PREPARED STATEMENT OF CHRISTINE A. HANSEN

The Iowa State Commerce Commission has a vital interest in federal natural gas policy because of its enormous impact on our state. We are pleased to have an opportunity to present testimony concerning the state of natural gas markets and hope you will consider the Iowa Commerce Commission as an ongoing resource to your committee on the subject of natural gas.

I am particularly pleased that the Joint Economic Committee chose to bring this hearing to Iowa, a state which is particularly hard-hit by the escalating price of natural gas. The heating season in the Upper Midwest is long and bitter. Natural gas consumers in this state--both large and small volume consumers--are getting as bitter as the weather about the price they pay for fuel. The cause of this bitterness is simply that natural gas has reached its market clearing price--has exceeded its market clearing price for the most part--and the market is absolutely unable to respond to the consumer reaction.

The federal government must respond quickly to correct those errors which prohibit the natural gas market from operating correctly. There is a continuing misconception in the natural gas industry that prices have room to move upward.

Our major supplier, Northern Natural Gas Pipeline, has recently predicted that we will see no large increases from them in 1983 and 1984.

That company estimates an increase in each of those years at a level about 10 percent above inflation. Such an increase will not be tolerated by this market.

The natural gas industry also fosters the misconception that what we are experiencing is a temporary surplus, and former levels of consumption will make the surplus vanish as soon as we have an economic recovery. That is nonsense.

The Iowa Commerce Commission has developed a Natural Gas Task Force which researches natural gas topics of importance to Iowa. The findings of this group, however, are some of the most statistically solid results in the country and are clear evidence that the twin theories of the industry--that prices have room to move upward before drastic damage is done to the market and that the temporary surplus will disappear with economic recovery--are wrong. I have attached a copy of one of the comprehensive reports of our Natural Gas Task Force to this testimony and recommend that this committee study the detailed economic conclusions reached therein.

The Iowa Commerce Commission regulates the rates of six investor-owned gas and electric utilities and five gas only utilities. Iowa is also served by twenty-four gas and electric municipal utilities and seventeen gas only municipals. The Commission is charged with assuring adequate service is provided by the municipals, but we do not regulate their rates. We regulate 412 utilities in Iowa, 81 for rates and service and 331 for service only. In addition, we regulate more than a thousand grain dealers and grain warehouses.

By far our greatest volume of complaints stem from the prices charged for natural gas. The Commission has been as frustrated as the average consumer concerning natural gas rates, but we have been able to do something about it. We have met repeatedly with most members of the Iowa Congressional delegation, have suggested legislation which Senator Roger Jepsen has introduced and strongly advocated in the Senate and which the entire Congressional delegation introduced in the House.

We are one of three states in the nation with a full-time attorney stationed in Washington, D.C. (the other states are New York and California). The Commission has intervened in every case before the Federal Energy Regulatory Commission (FERC) which has potential impact on Iowa, and our attorney has been extremely effective for the citizens of Iowa.

However, prices still are too high. More than 80 percent of the residential natural gas bill of the typical Iowan is set in Washington. After this year's round of rate hikes, that will be closer to 90 percent. So, the Iowa Commerce Commission has 10 to 15 percent of the price to regulate and that represents primarily fixed system costs, safety, repair and billing charges. That leaves the Commission in an extremely frustrating position--we get all of the heat and have none of the avenues to provide meaningful relief to consumers.

Not surprisingly for those of you who know Iowans, the Iowa consumers have been providing most of their own relief.

The Iowa reaction to dramatic increases in natural gas prices since enactment of the Natural Gas Policy Act in 1978 has been equally dramatic. The attached Appendix A demonstrates that market reaction. In 1970, total sales in Iowa were more than 307 million MCFs, with accompanying total revenue of more than $176 million. By 1981, we have seen a substantial drop in total sales to 217 million MCFs, with an accompanying astronomical jump in total revenue of $731 million. During that same period, total customers in Iowa increased by 100,000. Also attached as Appendix A is a breakdown of total Iowa sales and use figures by industrial and residential classes.

Iowans will continue to react to increased natural gas prices in that same way.

A fact which I have not seen well documented outside of Iowa is that our residential customers have just as much price elasticity as industrial and commercial customers. Granted, the shock to a distribution company's system of a large industrial load being dropped is stronger than the gradual eroding of residential customer use. However, the gradual residential load loss may, in the long run, be the loss which bleeds the distribution system toward financial ruin.

In Iowa, the marketing problems resulting from natural gas price reaction are particularly noteworthy in the residential and industrial sectors, but I predict the commercial sector is going to be playing some very fast catch-up. For the twelve months ending November 1982, total MCF sales in Iowa were down 5.3 percent, while commercial sales dipped more than 16 percent for the same period. November 1982, as compared to November 1981, demonstrated a total Iowa decrease in natural gas consumption for the month of 3.2 percent, while the drop in commercial sales was more than 8 percent.

In the industrial sector, we have seen a loss of interruptible and of firm sales with a consequent deterioration of the load factors for the local utility companies. Iowa has also seen the shutdown of some large plants using great quantities of natural gas in the production process--such as farm fertilizer.

Dr. Charles Nevaril, Vice President of Terra Chemicals International of Sioux City, Iowa, testified before a joint Iowa Commerce Commission-FERC hearing in Des Moines last Monday concerning the hammerlock in which natural gas prices hold the future of his company. Three manufacturers of nitrogen fertilizer have already closed in Iowa, and three remain open but threatened. This is a national problem, and many of the closed plants will never reopen.

In other Iowa industries, we have witnessed the loss of large loads due in part to incremental pricing which really encouraged fuel switching to both coal and fuel oil. We are seeing some fuel switching in all segments of natural gas use to electricity. We are uniquely situated in Iowa with excess electrical capacity generated by coal and nuclear, at costs which are generally below the national average.

On the residential and commercial side, natural gas usage has been cut primarily through energy conservation. However, there has certainly been plenty of conservation in Iowa industry, and there is escalating fuel switching in the residential sector--along with a great deal of fuel substitution for base load heating.

We have seen extensive weatherization and retrofitting of homes, as well as significant increases in the energy efficiency of new construction.

What we are creating at lightening speed is a natural gas distribution system which has extreme weather sensitivity. That is, residents, industrials and commercials might heat respectively with kerosene space heaters, process heat and electric heat pumps until the temperature dips below 20 degrees. Then, they will all switch on the gas heat, creating a very uneven load and volume demands even the best of weather forecasters could not plan.

There is no question but that we have been an energy wasteful country. This has been particularly true of natural gas usage because it was an underpriced commodity for so many years.

In Iowa, we are beginning to correct patterns of waste with the vigor reserved to Iowans when they tackle a problem collectively. Continued mispricing of natural gas will only speed the current pace of changed usage patterns, and could well result in ultimately ruining the natural gas market.

The fact is, the natural gas market will never return to the "good old days" of high sales volumes--because it will not return to the "good old days" of low prices.

In Iowa, we are seeing greatly increasing sales of equipment which uses gas more efficiently such as energy-saver water heaters and gas stoves. There are continuing advances in gas appliances, such as the well-known Lenox pulse combustion furnace and the new Amana energy-saving furnace. Both are more than 90 percent efficient. The Lenox is manufactured in Marshalltown, Iowa and has been a bright spot in our state's economic picture. A second shift had to be added at the Lenox plant, and all the furnaces they can manufacture this winter have already been sold. I know of several people who have ordered them and are content to wait months for delivery. This furnace is vented with a plastic pipe out the side of the basement, rather than a metal pipe up the chimney, because of the minimal heat loss.

The Lenox furnace alone, per unit, will conserve 25 to 30 million BTUs of natural gas energy each year. That furnace is but a single example of hundreds of products on the market today--and thousands of products to follow in the near future--which have had and are going to continue to have an impact on total natural gas demand.

No economic turnaround will halt the production and purchase of those gas-saving appliances. No Iowan is going to rip the storm windows off or throw the blankets of attic insulation out. And, now that Iowans are becoming aware of the importance of weather-stripping, caulking and keeping the thermostat turned down, we are going to continue to do those things year after year.

Since the mid 1970s, we have seen a conservation effort on a per customer basis of about 25 percent. And, we have a great deal of conservation yet to do in this state.

While I personally applaud this conservation effort, as a commerce commissioner I must deal with the natural result of reduced demand. The fixed costs for the Iowa utilities are spread over lower sales volumes which means higher and higher prices for customers. This is particularly true for those utilities which are losing substantial industrial loads completely due to fuel switching. We have a concern that this will eventually threaten the financial integrity of local utilities.

Iowa has four gas distribution companies with total industrial sales representing more than 70 percent of their total load--and two companies where industrials represent more than 80 percent of the load. Percentage sales by class for each company, based on 1981 Iowa sales, are as follows:

	Residential Percentage of Total Sales	Commercial Percentage of Total Sales	Industrial Percentage of Total Sales	Percentage of Other Sales
Allerton	16%	3%	81%	0%
Great River	17	9	74	0
Interstate	15	9	76	0
Iowa Electric	35	23	41	1
Iowa-Illinois	34	19	45	2
Iowa Power	46	35	18	1
Iowa Public Service	30	17	51	2
Iowa Southern	44	25	31	0
Minnegasco	62	38	0	0
North Central	7	8	85	0
Peoples	33	21	46	0

Residential percentages range from 7% of North Central's total sales to 46% of Iowa Power's sales and 62% of Minnegasco's sales. Commercial percentages range from 3% of Allerton's sales to 35% of Iowa Power's sales and 38% of Minnegasco's sales. Industrial percentages range from none of Minnegasco's sales and 18% of Iowa Power's sales to 85% of North Central's total sales.

I believe this demonstrates the dilemma for the state regulator. We are the focus of criticism from consumers and state legislators, though we have control over a fraction of the price and have held that part of the price below the inflation level, and we see a gloomy financial picture for the state's natural gas utilities which all parties--including the utilities--seem quite unconcerned about.

What the state regulator would most like to see happen as soon as possible is for the natural gas market to be permitted to work. We would like to see the six inches of insulation someone just put in their attic last year result in the correct economic conclusion--a lower bill this winter.

The federal government simply must permit the market to work through modification of the Natural Gas Policy Act (NGPA). As we have seen with the Iowa experience, the NGPA did solve the supply problem which it set out to solve, and it did permit the market to react to real changes in natural gas pricing.

The continued existence of long-term producer-pipeline contracts with market frustrating clauses will prohibit efficient market reaction. Unless flexibility is forced into these long-term supply contracts, they will not reflect accurate demand and price levels in the future--as they do not reflect them today.

Any "wait and see" attitude on the part of Congress at this juncture will escalate the problem. If the marketing problems are not solved beginning this year, we will soon be looking at a very different natural gas market which, in the end, will hurt consumer, distributor, pipeline and producer.

Appendix A
Page 1

Iowa Natural Gas Usage, Revenue, and Customers
By Year*

Total Sales

Year	Total Sales in MCF's	Total Revenue	Total Customers	Heating Degree Days
1970	307,419,180	176,340,658	590,610	7062
1971	306,896,792	191,541,067	602,614	6828
1972	309,210,287	211,867,483	614,771	7528
1973	297,543,895	221,464,828	625,260	6261
1974	300,441,607	245,592,387	635,489	6610
1975	284,786,256	290,830,232	644,824	6792
1976	261,694,084	327,829,317	654,172	6884
1977	240,613,893	384,768,101	661,645	6585
1978	238,051,663	461,685,136	670,227	7567
1979	237,719,553	557,513,996	682,006	7443
1980	226,218,129	626,029,467	695,833	6897
1981	214,012,621	731,402,534	705,331	6232

*covers approximately 97% of statewide sales

Iowa Natural Gas Usage, Revenue, and Customers By Year*

Industrial Sales

Year	Industrial Sales in MCF's	Industrial Revenue	Industrial customers	Heating Degree Days
1970	121,698,950	44,144,798	1,446	7062
1971	119,545,766	47,594,007	1,542	6828
1972	119,205,654	53,208,471	1,550	7528
1973	122,808,987	62,509,863	1,577	6261
1974	124,659,725	73,198,013	1,551	6610
1975	112,450,770	79,961,510	1,464	6792
1976	105,034,983	103,007,431	1,481	6884
1977	97,997,617	128,425,547	1,551	6585
1978	89,192,566	144,708,000	1,542	7567
1979	90,919,971	183,039,844	1,551	7443
1980	93,324,810	227,049,986	1,560	6897
1981	94,811,624	287,199,250	1,575	6232

*covers approximately 97% of state wide sales

Iowa Natural Gas Usage, Revenue, and Customers By Year*

Residential Sales

Year	Residential Sales in MCF's	Residential Revenue	Residential Customers	Heating Degree Days
1970	86,917,625	83,603,777	527,366	7062
1971	87,680,403	89,550,077	537,750	6828
1972	93,002,039	99,411,495	548,146	7528
1973	83,407,522	97,111,409	557,406	6261
1974	84,674,669	103,881,592	566,304	6610
1975	86,607,865	122,723,618	574,588	6792
1976	86,503,702	138,466,517	583,228	6884
1977	83,876,796	162,136,153	590,465	6585
1978	89,731,983	201,496,165	598,748	7567
1979	89,251,223	238,778,199	609,648	7443
1980	79,407,523	250,661,357	621,664	6897
1981	72,046,569	281,116,995	629,361	6232

*covers approximately 97% of statewide sales

NATURAL GAS POLICY TASK FORCE OF THE IOWA STATE COMMERCE COMMISSION

REVISED
FIRST REPORT

Task Force Members:

Robert Latham
Michael May
Diane McIntire
Joseph Murphy
John Pearce
Donald Stursma

August 4, 1982

SECTION I

THE PHYSICAL NATURAL GAS SUPPLY SYSTEM IN IOWA

Natural Gas is delivered to Iowa by three interstate natural gas pipeline companies: Northern Natural Gas Company (Northern Natural), Natural Gas Pipeline Company of America (Nat. Gas Pipeline Co.), and Michigan Wisconsin Pipeline Company (Mich.-Wis.). Northern Border Pipeline Company will commence deliveries of gas in Iowa this fall, but all deliveries to utilities will be through Northern Natural.

Natural gas enters Iowa on main line transmission pipelines, and is delivered to the point of sale by lateral pipelines. Northern Natural's practice has been to own and operate all laterals up to the community served (except for several low-pressure lines) although "contributions in aid of construction" were made by distribution companies for many laterals. Nat. Gas Pipeline Co., with a few exceptions, sells gas from the main line and requires the purchaser to provide the lateral to the distribution center. Michigan Wisconsin is a mixture of the two practices. A map of Iowa pipelines would show: Northern Natural has a far-flung many-branched transmission network providing gas service to approximately two-thirds of Iowa's geographic area, while the laterals of Nat. Gas Pipeline Co. and Mich.-Wis. are, except for high density population areas, fairly short with few connections.1/

The following table shows the sales volumes of the pipelines serving Iowa for 19812/ (numbers of customers served by each company are not available).

1/See Appendix B for a detailed listing by Company of natural gas pipeline sizes and mileage.

2/FERC Form No. 2: Annual Report of Natural Gas Companies (Class A and Class B) 1981.

1981 Natural Gas Sales in Iowa (Bcf)

	Direct Distribution Sales	Field & Main Line Industrial Sales	Sales for Resale	Total	%
InterNorth (Northern)	27.7*	8.9	100.8	137.4	60.6
Natural	-0-	.02	60.96	60.98	26.9
Mich-Wisc.	-0-	-0-	28.38	28.38	12.5
				226.76	100.0

(*Peoples Natural Gas Company)

Natural gas delivered by the interstate pipelines in Iowa is resold to end users by 10 investor-owned utility companies, one privately owned company, and 41 municipal utilities. As of 1980, the last year for which full data compilation is available, the number and type of customers and the volumes of gas purchased are as follows:

Number of customers by Class of Service - 1980
(Thousands)

	Residential	Commercial	Industrial	Other	Total
All Iowa	664.5	78.6	1.9	0.3	745.4
	89.15%	10.55%	0.26%	0.04%	100 %
8 Largest Iowa Util.	640.6	75.9	1.6	.02	718.1
	89.21%	10.57%	.22%	—	100 %

Sales Volumes by Class of Service - 1980
(Bcf)

	Residential	Commercial	Industrial	Other	Total
All Iowa	84.4	51.2	118.3 (a)	0.7	254.6
	33.2%	20.1%	46.4%	0.3%	100 %
				(b)	
8 Largest Iowa Util.	80.8	50.7	110.6	4.5	246.6
	32.8%	20.6%	44.8%	1.8%	100.0

(a) Value includes 3.4 Bcf Electric Generation
(b) Differences between Industrial and Other volumes in the two cases appear due to different definition of terms. Note: sum of percentages almost identical.

Industrial and Commercial gas usage can be further broken down as follows:

Iowa Firm and Interruptible Gas Sales Volumes - 1980[3]

	Volume (Bcf)	%	% Total Sales
Commercial			
Firm	41.6	81	16.3
Interruptible	9.6	19	3.7
Total	51.2	100	20.1
Industrial			
Firm	84.1	71	35.0
Interruptible	34.2	29	13.4
Total	118.3	100	46.4

The following table shows, for the 8 largest Iowa utilities, total 1981 customers and sales volumes and the amount of gas received from each supplier. As was previously noted, data on the number of customers served off each supplier were not available.

Customer Sales, and Supplier Data - 1981
8 Largest Iowa Utilities

Company	(1) Customers	(2) Util. Sales (Bcf)	(3) Suppliers	(4) Supplier Sales (Bcf)	(5) %
Peoples Nat. Gas	116,614	36.62	NNG	36.51	98.6
			NGP	0.52	1.4
Iowa Southern	37,773	9.03	NNG	0.73	7.8
			NGP	1.90	20.4
			MW	6.70	71.8
IPS	109.494	36.03	NNG	36.8	100
Iowa Power	132,835	29.6	NNG	26.65	88.4
			NGP	3.51	11.6
Iowa-Illinois	158,052	47.16	NNG	6.18	13.1
			NGP	41.13*	86.9
Iowa-Electric	118,971	33.42	NNG	18.32	54.4
			NGP	14.44	42.9
			MW	0.92	2.7
Interstate Power	31,592	22.16	NNG	5.12*	23.1
			NGP	17.04*	76.9
North Central PSC	12,813	17.94	NNG	1.64	9.1
			NGP	.06	0.03
			MW	16.39	90.6

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[3] American Gas Association, "Gas Facts", 1980.

Col. (1) Summary of Information Compiled by ISCC Staff (Accounting) from Utility Company Annual Reports for the 8 largest companies which account for 97% of Iowa Customers and sales: Peoples Natural Gas, Iowa Southern, Iowa Public Service, Iowa Power, Iowa-Illinois, Iowa Electric, Interstate Power, North Central PSC.

Col. (2) Annual Reports - Rate Regulated Gas Utilities, 1981.

Col. (4) Unless otherwise noted, these are pipeline company sales to utilities. Totals will exceed Utility Sales by 2-3% due to unaccounted for gas. *Indicates Utility Sales figure; adequate pipeline sales data not available.

Col. (5) % of total pipeline purchases.

The following two tables show for 1981 the revenues of the pipeline suppliers from Iowa sales and plant and revenue information for the largest Iowa utilities. No data were available by state for interstate pipeline plant in service.

1981 Interstate Pipeline Revenues
From Total Sales in Iowa

Company	Revenue(s)	%	Avg. Price Per Mcf ($)
Northern	$410,389,420	61.5	2.9868
Natural	158,968,576	23.8	2.6076
Mich-Wisc.	98,298,926	14.7	3.4634

Plant and Revenue Data - 1981
8 Largest Iowa Utilities

Company	Total Plant In Service($)	%	Revenue ($)	%	Avg Rev Per Mcf ($)	Revenue/ Plant Ratio
Peoples	71,564,123	16.1	125,976,140	15.9	3.44	1.76
Iowa Southern	16,765,276	3.8	35,067,859	4.4	3.89	2.09
IPS	71,930,370	16.2	115,484,267	14.6	3.20	1.61
Iowa Power	88,660,385	20.0	105,682,746	13.3	3.57	1.19
Iowa-Illinois	111,870,231	25.2	173,897,896	21.9	3.68	1.55
Iowa Electric	57,316,113	12.9	111,494,235	14.0	3.34	1.95
Interstate	17,899,896	4.0	64,199,449	8.1	2.89	3.59*
North Central PSC	7,266,178	1.6	62,084,181	7.8	3.46	8.54**
	443,272,572		793,486,753			

* Distorted by $46.2M in sales to large industrial users.

**Distorted by $55.5M in sales to large industrial users. Largest customer is not currently using gas.

SECTION II

THE TARIFFS AND CONTRACTS GOVERNING THE TRANSPORTATION AND SALE OF NATURAL GAS IN IOWA

Review of filed tariffs and contracts[4] made thereunder has been criticized as both wrong and irrelevant:

> Only in the world of regulation are contracts the Talmud as commission rules and orders are the Torah. A scholastic preoccupation with contract terms is, therefore, a predictable quirk of utility officials, commission staffs, and lawyers who have never practiced in that other world in which firms compete with one another and are occasionally allowed to fail. In that outside world where the gas industry will presently find itself, contracts that do not make sense are routinely walked away from, repudiated, or renegotiated -- and without the prodding or support of special legislation, rules, or orders.[5]

The author of the above quote subsequently identifies as one defense to a bad contract in that "other world", that of a seller attempting to collect from an "insolvent utility incapable of raising its rates because of consumer resistance."[6] Obviously, identification of such a disastrous "remedy" demonstrates a continued need to review contracts which are expressly subject to the authority of FERC and this Commission in order to exhaust less disastrous remedies than utility insolvency.

Bearing in mind the foregoing "other world" criticism of contract and tariff analysis as well as possible limitation on commission authority to redress things such as "take or pay" provisions,[7] useful analysis can still be had on this subject.

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[4] E.g., Foster Associates, Inc., Washington, D.C., "Pricing Provisions for Natural Gas Sales Contracts -- A Statistical Report" prepared for The Natural Gas Supply Association, April, 1982. Study analyzed producer contracts including the frequency of utilization of such items as kick-out clauses (i.e., contract form permitting buyer to escape a contract on the basis of economic, marketing or regulatory conditions).

[5] Tussing, A. R. and Connie C. Barlow, "The Rise and Fall of Regulation In The Natural Gas Industry," Public Utilities Fortnightly, March 4, 1982 at 18.

[6] Id. at 22

Because the majority of the 109 contracts[8] filed in respone to a data request are standard contracts made under FERC approved tariffs the focus of the following analysis is the FERC tariffs. It is under the FERC tariffs and the broader domain of FERC jurisdiction that such current controversies as take or pay contracts[9] are being actively addressed.

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[7] State ex. rel. Pow. Co. v. Department of Pub. Serv. Reg., 548 P.2d 136 (Montana 1975). The case which found that a regulatory authority had exceeded its authority in effectively forcing a utility to break "take or pay" contracts is not satisfactory because it dealt with a temporary agency decision and the correct opinion is somewhat conclusory in its discussion.

[8] The figure of 109 contracts reviewed does not include amendments to those contracts or the blank form contracts used by gas utilities under the Commission's jurisdiction.

[9] E.g., It is FERC policy to consider "take-or-pay" penalties as bearing on requests by pipelines for authorization to make off-system sales. Natural Gas Pipeline Company of America, Docket No. CP81-392-000, "Findings and order after statutory Hearing Issuing Certification of Public Convenience and Necesity and Granting positions to Intervene," (Issued November 13, 1981) 17 FERC § 61,133. FERC also monitors compliance that contractural "take-or-pay" provisions comply with FERC regulations:

> We will deny rehearing and reconsideration. As we explained in our February 9, 1981 orders, Exxon's take-or-pay provisions do not comply with Section 154.103 because the monetary credit provided for therein operates in a different fashion than the gas make-up provision prescribed in Section 154.103. Specifically, Exxon's make-up provision treats the purchaser's prepayment as a loan, the repayment of which is not completed until the expiration of the contract term. Since there is no interest charge applied to the load, the recoupment arrangement can be extremely burdensome to the purchaser, particularly where the recoupment is allowed to occur over a period of some 10 or 15 years.
>
> The Commission recognizes, of course, that a standard Section 154.103 gas make-up provision has has the effect of providing the producer with interest-free capital. Unlike the Exxon situation, however, the duration of such an interest-free loan is limited to the period of time elapsing between the time the prepayment is made and the time the buyer is in a position to make up the gas-in most cases, no more than a few years.

Exxon Corporation, Docket Nos. CI-78-758, et. al, "Order Denying Rehearing and Reconsideration" (Issued May 28, 1981) 15 FERC 61,179.

An instructive initial step in reviewing the FERC approved tariffs is a brief definition of the gas rates: (a) two-part rate, (b) one-part demand rate and (c) one-part commodity rate.

A two-part rate is composed of a demand rate and a separate commodity rate. The demand rate is usually applied to some contractual "maximum daily entitlement" from the pipeline (or maximum storage withdrawal volumes), to determine the monthly demand charge. This demand charge serves as a minimum monthly charge, independent of the actual monthly volume taken (or withdrawn from storage). The actual monthly volume taken is then applied to the commodity rate to determine the monthly commodity charge. The total monthly charge, then, under the two-part rate, is the sum of the separately determined demand charge and commodity charge.

A demand rate is analogous to the "demand rate" portion of the two-part rate. Therefore, under a one-part demand rate, the purchaser will pay a uniform monthly charge, regardless of the actual monthly volumes taken (or withdrawn from storage). As seen in the following table, the only instance of this rate is for storage services.

A one-part commodity rate, then, is analogous to the "commodity rate" portion of the two-part rate except that it normally includes demand components at an assumed load factor, and serves as the sole means of determining the monthly charge, as applied to actual monthly volumes taken. Therefore, under a one-part commodity rate, there is no minimum monthly charge (unless the sales contract contains a minimum "take-or-pay" provision).

The utilization of these types of rates can be seen in the following table.

BILLING METHODS APPLIED TO DIFFERENT CLASSIFICATIONS OF GAS SERVICE IN IOWA

Gas Service	Two-part Rate	One-Part Commodity Rate	Demand Rate
NATURAL			
DMQ-1	X		
G-1		X	
WS-1		X[1]	
WS-2		X[1]	
AOR-1		X	
S-1	X[3]		
MS-1			X
MS-2			X
MS-3			X
LS-1			X
LS-2			X
LS-3			X
NORTHERN			
CD-1	X		
SS-1	X		
WPS-1	X		
PS-1	X		
AOS-1		X	
ACDS-1	X[2]		
ERS-1	X[2]		
MICH-WISC			
CD-1	X		
SGS-1		X	
LVS-1		X	
OS-1		X	

[1] Take-or-pay; Take is required, pay is conditional on 'take'.

[2] Demand Portion of Rate is the nomination charge.

[3] Multi-part rate - Demand, Commodity, Injection and Withdrawal Charges.

Nat. Gas Pipeline's Daily Maximum Quantity Service Rate (DMQ-1) Northern Natural's contract Demand Service Rate (CD-1) and Mich-Wisc. contract Demand Service Rate (CD-1) are virtually identical with one exception. That exception -- a 75% "take-or-pay" provision in Mich-Wisc. CD-1 service -- doesn't apply in Iowa.

The DMQ-1 and CD-1 rates are for standard gas service, available on a firm twelve-month basis and billed according to a two-part rate. Seventeen of the contracts reviewed were of this type and nine of the CD-1 contracts run until 1991-1992.

Natural Gas Pipeline Co.'s General Service rate (G-1) is comparable to Mich-Wisc.'s Small General Service Rate (SGS-1). (Northern Natural doesn't have a comparable rate.) The G-1 and SGS-1 rates provide standard gas service to comparatively small volume purchasers (i.e., users not using more the approximately 6,000 Mcf per day), only three of this type of contract were found.

Winter service rates are offered by Natural Gas Pipeline Co. and Northern Natural while Mich-Wisc. makes no separate provision for this service. Eighteen contracts for winter service were found and most will not expire until 1991.

Natural Gas Pipeline Co's Winter Service rates (WS-1 and WS-2) are available to DMQ-1 and G-1 purchasers on a firm 120-day basis, based upon reserves available from specific tracts. A purchaser contracts for a maximum daily volume from the pipeline, and must take and pay for the equivalent of at least 100 days of this maximum daily volume. The rate is billed on a one-part commodity rate.

Northern Natural has three narrowly distinguished winter service rates:

Seasonal Service Demand (SS-1): This is available to CD-1 purchasers on a firm 4-month basis, from November 27 through March 26 of each heating season. It is billed according to a two-part rate.

Winter Period Service (WPS-1) and Peaking Service (PS-1): Available to CD-1 purchasers on a firm 3-month basis, from December 15 through March 15 of each heating season. This is billed according to a two-part rate. Commodity is billed on a monthly rate, but demand is billed on a three-month rate (to be paid in three monthly installments). WPS-1 demand is not to exceed 10% of purchaser's CD-1 demand.

Natural Gas Pipeline Co., Northern Natural and Mich-Wisc. have various authorized over-run services which are virtually identical. Natural Gas Pipeline Co.'s AOR1 rate is typical and is available to DMQ-1 or G-1 purchasers on an interruptible, day-to-day basis. The availability of AOR-1 on a given day is based on the pipeline's ability to meet its firm load requirements for that day. The rate is billed on a one-part commodity rate.

Two services deserving of mention (other than Natural Gas Pipeline Co's storage rates set out in Appendix C) are Northern Natural's Agricultural Crop Dryer Service (ACDS-1) and Mich-Wisc.'s Large Volume Special Industrial Service (LVS-1).

The ACDS-1 rate is available to CD-1 purchasers on a firm basis when available, for the limited purpose of drying seed grain and other crops. A purchaser determines the availability of ACDS by requesting (nominating) specified ACDS volumes from the pipeline, in advance. The availability of volumes varies daily, based on the pipeline's firm load requirements. These are billed according to a two-part rate: a commodity rate and a small nomination charge.

The LVS-1 rate is available to CD-1 purchasers on a limited firm 12-month basis, for resale to a specified large volume customer whose contract demand is not less than the greater of 6,000 dth or 3% of purchaser's CD-1 contract demand. Service is limited firm in that the pipeline may curtail up to 40% of the LVS-1 daily contract demand, to meet its other firm load requirements. This is billed on a one-part commodity rate.

The foregoing preliminary review suggests at least one troublesome area, i.e., the duration of existing contracts into the 1990's and the consequent diminished flexibility available to jurisdictional utilities to deal with the changing market conditions of deregulation. Although this inflexibility is expressly subject to FERC jurisdiction, it still is a potential difficulty.

The monthly minimum charge feature of the tariffed rates gives meaning to contract duration and minimum quantity. All the major contracts have minimum charge provisions (e.g., the demand portion in the CD-1 rate). If the FERC moves towards reflecting more of demand costs in the demand charge, these minimums will become relatively more important in affecting bills. The reasonableness of these monthly minimum charge provisions is an open question and becomes more important particularly where substantial reductions in demand and commodity purchases are expected as prices rise.

SECTION III

OBSERVED IMPACTS AND EXPECTED IMPACTS OF CHANGES IN WELL-HEAD PRICES ON NATURAL GAS CONSUMPTION IN IOWA

A. This report is a summary of a study of the relationships in Iowa between yearly natural gas usage on a per customer basis and the factors which are observed to affect such usage. The purpose of this study is to predict the extent to which natural gas usage per customer in Iowa, by major customer class, is expected to be affected by changes in real retail prices and real well-head prices of natural gas. In the study, other factors affecting usage by customer classes are also considered. These additional factors include real income, heating degree days, and the real price of fuel oil. Data used in the study are yearly data for the years 1969-81. Data are for each of the eight major Iowa natural gas utilities (Interstate, Iowa Electric, Iowa-Illinois, Iowa Power, Iowa Public Service, Iowa Southern, North Central and Peoples). Together, these utilities account for approximately 97% of Iowa sales and customers of gas utilities.

All price and income data are in real (1967) terms, being deflated by the Consumer Price Index - Wage Earners. Data include average usage per customer for each major customer class (residential, commercial, industrial and "other" including electric generating plant usage). Per capita personal income data by county by year were used, with the per capita personal income for a given utility reflecting weighted averages of the income figures for the counties in its service territory. Yearly heating degree days from seven weather stations around the state were used, weighted by individual utility sales in each region, to arrive at yearly measures of heating degree days for each utility. Yearly fuel oil prices are reflected by the North Central Region index of #2 heating oil prices. Retail natural gas prices by year by utility by customer class were determined as average prices by dividing customer class revenues by class MCF's.

Well-head prices of natural gas by utility by customer class were more difficult to estimate. As seen in the discussion in Sections I and II of this Report, nearly all distribution (retail) utilities purchase gas from more than one transmission pipeline. Therefore, for each customer class for each distribution utility, the percentage of natural gas originating from each transmission pipeline was determined. Average yearly well-head prices per transmission utility were weighted by these percentages to obtain a weighted well-head price of gas for each retail customer class for each utility.

Given these data, a number of questions were addressed. What changes in per customer usage, real retail prices, and real well-head prices have occurred over the 1969-81 period? Second, what is the relationship between real well-head prices and real retail prices for each customer class for each utility? Have these relationships changed through time as the well-head prices and pipeline price structures have changed? The third question is what is the impact of changes in real retail prices on customer class usage after making appropriate adjustments for heating degree days and current real oil prices and real incomes? Next, since retail prices are expected to be related to well-head prices, how does retail usage change as well-head prices change? Finally, what are the likely changes in usage by customer class and in total for each utility as real well-head prices change?

B. Changes in Usage, Prices and Income between 1969 and 1981 - For the 1969-81 time period, considerable change has occured in the variables which may be affecting the usage of natural gas in Iowa. The experience of Iowa Electric, as an example of the impact on one utility, is instructive. Results differ, of course among Iowa utilities.

Table I
Iowa Electric 1969 vs 1981
(Real 1967 Dollars)

Variable	1969	1981
Residential Sales (MCF)	13,239,144	11,774,476
Residential Customers	79,503	102,457
Usage per Residential		
Customer (MCF) - Actual	166.5	114.9
Customer (MCF) - Weather normalized	161.8	123.7
Real Retail Price - Residential/MCF	$0.813	$1.385
Real Well-Head Price - Residential/MCF	$0.140	$0.687
Commercial Sales (MCF)	7,999,363	7,539,662
Commercial Customers	11,070	16,054
Usage per Commercial Customer (MCF)	722.6	469.6
Real Retail Price - Commercial/MCF	$0.565	$1.245
Real Well-Head Price - Industrial/MCF	$0.140	%0.689
Industrial Sales (MCF)	21,479,439	13,796,649
Industrial Customers	239	451
Usage per Industrial Customer (MCF)	89,872	30,591
Real Retail Price - Industrial/MCF	$0.288	$1.115
Real Well-Head Price - Industrial/MCF	$0.145	$0.742
Other Sales (MCF)	9,538,702	309.053
Other Customers	10	9
Usage per Other Customer(MCF)	953,870	34,339
Real Retail Price - Other/MCF	$0.252	$1.183
Real Well-Head Price - Other/MCF	$0.145	$0.742
Total Sales (MCF)	52,256,648	33,419,840
Total Customers	90,822	118,971
Usage per Total Customer(MCF)	575.2	280.9
Real Retail Price - Total/MCF	$0.457	$1.240
Real Well-Head Price - Total/MCF	$0.143	$0.711
Real Electric Price - Residential/kWh	$0.0223	$0.0229
Real Electric Price - Commercial/kWh	$0.0232	$0.0244
Real Electric Price - Industrial/kWh	$0.0123	$0.0167
Real Electric Price - Other/kWh	$0.0268	$0.0244
Real Fuel Oil Price (Index)	97.00	251.26
Real Income/Capita	$3206.74	$3815.61
Heating Degree Days (yearly)	7443	6255
Heating Degree Days (69-81 yearly average)	7089	7089

For these utilities as a whole, the following results were obtained by comparing 1970 results with those of 1981:

Table II
Iowa Totals - 8 Major Utilities
(Real 1967 Dollars)

Variable	1970	1981
Residential MCF	88,375,773	73,290,448
Commercial MCF	52,996,785	46,656,693
Industrial MCF	134,649,607	110,012,632
Other MCF	47,525,729	2,232,849
Total MCF	323,547,894	231,955,006
Res. Usage/Cust.	164.6	114.4
Comm. Usage/Cust.	842.4	614.4
Ind. Usage/Cust.	92,925.9	69,584.2
Other Usage/Cust.	3,168,381.9	131,344.1
Total Usage/Cust.	538.0	323.0
Res.-Real Retail Price	$0.829	1.452
Comm.-Real Retail Price	0.589	1.304
Ind.-Real Retail Price	0.313	1.145
Other-Real Retail Price	0.242	1.129
Total-Real Retail Price	0.488	1.272
Res.-Real Well-Head Price	0.143	0.699
Comm.-Real Well-Head Price	0.142	0.695
Ind.-Real Well-Head Price	0.147	0.738
Total Real Well-Head Price	0.144	0.718

As a further basis for comparison, Iowa prices by customer class were compared with U.S. average prices for 1980. These results are presented in Table III.

In summary, considerable changes did occur during this period both in the market for natural gas and in markets for gas substitutes, particularly fuel oil. Our next problem is to identify why usage per customer changed the way it did.

C. Relationships between Real Well-Head Prices and Real Retail Prices by Customer Class by Utility. To be able to predict the expected impact of a change in well-head prices on usage in Iowa, it is instructive and necessary to establish the relationships between real well-head prices and real retail prices. Plots of the relationships between these

Table III

AVERAGE PRICES $/MCF (1980)

	Residential	Commercial	Industrial	All Sectors	City Gate (Ave. Pipeline Rate)
(1) U.S.	3.61	3.34	2.81	3.13	2.41
(2) Iowa	3.20	2.85	2.51	2.81	2.34
(3) 9 Largest Investor Owned Utilities in Iowa	3.15	2.82	2.51	2.78	2.38
By Pipeline					
Northern	3.02	2.68	2.23	2.64	2.25
Natural	3.36	3.08	2.66	2.95	2.34
M-W	3.58	3.24	2.91	3.04	2.82

Sources: (1) and (2): Gas Facts 1980, American Gas Association (AGA)*

(3): 1980 IG-1 reports from Great River Gas Co., Interstate Power Co., Iowa Electric Light and Power Co., Iowa-Illinois Gas and Electric Co., Iowa Power and Light Co., Iowa Public Service Co., Iowa Southern Utilities Co., North Central Public Service Co., Peoples Natural Gas Co.

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* AGA states that 1981 data will be available in October or November 1982.

variables suggest that, as real well-head prices have increased in recent years, real retail prices have also increased, but by considerably smaller percentages. Exhibits I - V are instructive in noting these relationships. (These exhibits reflect real retail prices (RGPR's) plotted against real well-head prices (WTWHPR's) by customer class - R=Residential, C=Commercial, I=Industrial, O=Other, and T=Total).

The following estimated equations provide empirical relationships for the plots from Exhibits I-V. These cross section-time series relationships were estimated for the time period 1969-81 for the eight major gas utilities.

Table IV
Real Retail/Well-Head Price Relationships

Residential	Real Retail Price = 1.511 (Real WH Price)$^{(0.311)}$	$R^2 = .86$
Commercial	Real Retail Price = 1.486 (Real WH Price)$^{(0.469)}$	$R^2 = .94$
Industrial	Real Retail Price = 1.492 (Real WH Price)$^{(0.771)}$	$R^2 = .95$
Total	Real Retail Price = 1.502 (Real WH Price)$^{(0.563)}$	$R^2 = .87$

(All coefficients are significant at the .01 level)

In interpreting these equations, the power on real well-head price of "Total" of 0.563 implies that for every one percent increase in real well-head prices, there is a 0.563 percent increase in real retail price. No significant differences among utilities were observed. These models, of course, were estimated over the range of actual data and caution is required in projecting these relationships for real well-head prices considerably beyond the range of experience. It should be noted, however, that these relationships have been highly consistent through significant changes in pipeline pricing practices, changes in the cost of capital, and periods of curtailments.

In summary, the ratios between real retail prices and real well-head price have changed considerably since 1969 as well-head costs have constituted a greater percentage of retail prices. The relationship between these have exhibited obvious patterns. Simple estimating equations (log-linear models) are useful in estimating these relationships.

D. Impact of Real Retail Price Changes on Customer Class Usage by Utility - Yearly usage per customer has exhibited significant change (decrease) since 1969. Real retail prices have increased dramatically, especially for industrial customers. With minor changes in real income and real electric prices, effects on gas usage of changes in real retail prices and real prices of substitute fuels (fuel oil, in particular) should be observed after adjusting for heating degree days. In this study, demand models were estimated for each major customer class (excluding "Other") and for utility "Total" per customer usage as a whole.

Individual models were tested over data ranging from 1969-81 to 1977-81 to determine if significant structural changes have occurred (oil embargo "shock" or post 1977 gas decontrol). Models for Commercial, Industrial and Total are generally insensitive to time period chosen while Residential models are insensitive to time period over the 1972-81 period.

Dependent variables (to be explained) were per customer usage per year by customer class, to reduce problems of heteroscedasticity. Real retail price, real income, real price of electricity, real price of fuel oil, and heating degree days were used as independent variables in log-linear models. (The real price of electricity was not significant in these models). Dummy variables reflecting each individual utility were used to account for differences in customer class composition (definitions of commercial and industrial customers may differ, for example, by utility). Dummy variables took on values of 1 or 0, with 1 used to reflect the specific utility. The following is a summary of representative models by customer class. All models are of the form:

$$Q = A_1 \cdot P_G^{(A_2)} \cdot Y^{(A_3)} \cdot P_0^{(A_4)} \cdot HDD^{(A_5)} \cdot e^{(AJ.DJ)}$$

where

Q = Average yearly usage per customer per utility
P_G = Real average retail gas price
Y = Real per capital personal income
P_0 = Real price index for fuel oil
HDD = Yearly heating degree days
DJ = Dummy variable reflecting the J = (8-1) utilities
A_1 = Intercept/multiplicative variable
A_2 = Price elasticity for gas
A_3 = Income elasticity
A_4 = Cross-price elasticity with fuel oil
A_5 = HDD elasticity
A_J = Coefficient on the J-th dummy variable.

A_6 = IPS; A_7 = INT; A_8 = PNG; A_9 = I-Ī; A_{10} = IPWR; A_{11} = ISOU; A_{12} = NCENT; IE is the basic model.

Representative results are the following:
(Standard errors are in parenthesis)

Table V
Variables Coefficients

Model	Log A_1	A_2	A_3	A_4	A_5	A_6	A_7	A_8	A_9	A_{10}	A_{11}	A_{12}	
Residential	-4.18	-0.42	.48		.59	-.04	.02	.08	.05	.10	.15	.02	0.91
(74-81)	(0.94)	(.03)	(0.17)		(.10)	(.02)	(.02)	(.02)	(.02)	(.02)	(.02)	(.02)	
Commercial	-2.74	-0.36	0.38		.67	.07	.20	.22	-.46	.54	.34	.77	0.96
(74-81)	(1.74)	(.04)	(.31)		(.17)	(.03)	(.04)	(.03)	(.03)	(.03)	(.03)	(.03)	
Industrial	8.01	- .55		.45		.28	1.99	.40	1.30	.75	-.22	4.44	0.99
(74-81)	(0.76)	(0.08)		(.14)		(.07)	(.07)	(.07)	(.07)	(.07)	(.17)	(.07)	
Total	1.61	-.49		.12	.40	.06	.54	.06	.07	-.14	-.12	1.48	
(74-81)	(2.23)	(.07)		(.11)	(.20)	(.04)	(.04)	(.04)	(.04)	(.05)	(.05)	(.04)	

Models for "Other" consumers were not estimated, since this market is, to a great extent, being phased out. The inclusion of "Other" in the total does, however, may have the effect of causing a slight upward bias in the total price elasticity as is noted below in the well-head price models.

From these models, total customers as a group, a price elasticity$^{(A_2)}$ of approximately -.49 is estimated. As such, for a one percent increase in the real price of gas, total usage per customer would be expected to fall by about 49/100 of one percent, everything else equal.

E. Impact of Real Well-Head Price Changes on Usage by Customer Class by Utility. - From Sections B and C above, estimation has been presented regarding relationships between well-head and retail prices and between retail prices and usage by customer class. From these two sets of estimated equations, it is possible to estimate the relationship between usage and real well-head prices. If usage is a function of real retail price and retail price is a function of real well-head price, then usage is a function of real well-head price.

Let $R = \alpha_1 W^{\alpha_2}$

then $Q = \alpha_3(\alpha_1 W^{\alpha_2}) \cdot L^{\alpha_4} = \alpha_3 \cdot \alpha_1^{\alpha_4} W^{\alpha_2 \cdot \alpha_4} \cdot L = \alpha_5 W^{\alpha_6} \cdot L$

where R is the retail price, W is the well-head price, L is a factor reflecting other variables, and Q is the quantity consumed. The well-head price elasticity, α_6, would simply equal the retail price elasticity(α_4) times α_2.

Table VI

Model	α_2	α_4	$\alpha_2 \cdot \alpha_4 = \alpha_6$
Residential	.311	-.42	-.13
Commercial	.469	-.36	-.17
Industrial	.771	-.55	-.42
Total	.563	-.49	-.28

As such, using this method, well-head "price elasticities should range from -.13 to -.42 depending on the customer class.

If, indeed, a functional relationship exists between retail and well-head prices, the relationships between usage and well-head prices could be directly estimated rather than inferred as presented above. The following is a summary of the results of these independent estimates.

$$Q = B_1 P_{WH}^{B_2} \cdot Y^{A_3} \cdot P_0^{A_4} \cdot HDD^{A_5} \cdot e^{A_J \cdot D_J}$$

where variables are as previously defined except that real well-head prices are used.

Well-Head Prices Models
(Standard Errors in parenthesis)

Table VII
Variable Coefficients

Model	Log B_1	B_2	A_3	A_4	A_5	A_6	A_7	A_8	A_9	A_{10}	A_{11}	A_{12}	R^2
Residential	-5.25	-.17	.50		.66	-.07	.03	.04	.02	.07	.15	-.02	.93
(74-81)	(0.84)	(.01)	(.15)		(.09)	.02	.02	.01	.01	.02	.02	.01	
Commercial	-1.71	-.17	.17		.73	.03	.20	.19	.42	.53	.34	.74	.95
(74-81)	(1.75)	(.02)	(.32)		(.18)	(.03)	(.04)	(.03)	(.03)	(.03)	(.03)	(.03)	
Industrial	6.87	-.46		.62		.25	2.05	.38	1.22	.72	-.21	4.47	.99
(74-81)	(.99)	(.07)		(.18)		(.07)	(.07)	(.07)	(.07)	(.07)	(.07)	(.07)	
Total	1.09	-.34		.28	.46	.03	.61	.01	.01	-.21	-.14	1.54	.98
(74-81)	(2.51)	(.05)		(.14)	(.22)	(.04)	(.04)	(.04)	(.04)	(.04)	(.05)	(.04)	
Total													
(Exc. Other)	-1.03	-.34		.32	.56	.02	.63	.04	.02	-.20	-.11	1.96	.99
(74-81)	(2.22)	(.04)		(.12)	(.20)	(.04)	(.04)	(.04)	(.04)	(.04)	(.05)	(.04)	

A comparison of the predicted well-head price elasticities (Table VI) with the actual estimated elasticities (Table VII) suggests that the estimates and predicted are similar for all models. It should also be noted that Table VII includes a model of "Total" (excluding "Other) which, as expected, has a slightly lower (not observed here due to rounding) price elasticity than the total model. For predictive purposes, this model should be used since the "Other" category has become insignificant in recent years.

In sum, it is estimated that for each one percent increase in real well-head prices, retail residential and commercial sales volumes per customer would be expected to fall by 13-17/100 of a percent, industrial sales per customer would fall by 44/100 of a percent, and total sales per customer would fall by 35/100 of one percent.

Since 1978, the real weighted well-head price of gas has risen at a compounded rate of greater than 20 percent per year in Iowa. From this, a seven percent (34/100 x .20) yearly decrease in total sales volumes per customer in Iowa would be expected if the 20 percent real compounded rate continues. Industrial sales per customer would fall by approximately nine percent per year while commercial and residential sales per customer would fall by about three percent yearly. These estimates assume normal heating degree days, no change in real income, and no change in the real price of fuel oil. Normal heating degree days must, of necessity be used; no change in real income or in the real price of heating oil differs from recent experience in which both of those have fallen. If these should continue to fall, expected natural gas sales must accordingly be further reduced.

Obviously, these estimates are conditional upon the anticipated real compounded changes in well-head prices. It is unrealistic to expect that real compounded price increases would continue at a 20% rate indefinately. Who would buy the gas? For 10 percent real well-head price increases, the expected yearly percentage reductions in sales would be one half of the reductions estimated above.

F. Summary - This study has suggested and provided empirical support for the factors affecting the quantities of natural gas demanded in Iowa. As real retail prices rise, as real income falls, as real fuel oil prices fall, and as heating degree days fall, natural gas usage per customer falls in Iowa by customer class by utility. Little change in the structure of these responses has occurred since 1969, suggesting that even with significant events occurring over the time period, customers appear to respond to real prices, real income, and real prices of substitutes in a reasonably consistent manner. What this study has added is a method of estimating by how much usage changes as these factors change. Further, logical links have been made between real well-head prices and real retail prices and between real well-head prices and usage. The primary results of these links are that consistency exists between methods and that estimates can be made of how much usage would change in Iowa as real well-head prices change. Results have been presented which allow such predictions to be made by customer class by utility and by utility total. The primary result is that overall usage per customer will fall by about 3.4% for each 10% increase in real well-head prices, everything else equal. The response by industrial customers would be considerably greater while responses by residential and commercial customers would be less in percentage terms.

APPENDIX B

PIPELINE MILEAGE

NATURAL GAS

SUPPLIERS

Michigan-Wisconsin

309.40 miles - 24"
10.50 miles - 16"
22.60 miles - 12"
13.00 miles - 10"
23.80 miles - 8"
106.62 miles - 6"
96.22 miles - 4"
3.00 miles - 3"
2.00 miles - 2" 587.14 miles

Natural Gas Pipe Line

256.00 miles - 24"
315.39 miles - 36"
4.87 miles - 30"
257.00 miles - 26"
40.60 miles - 20"
8.39 miles - 16"
3.48 miles - 12"
4.19 miles - 10"
4.05 miles - 8"
12.43 miles - 6"
11.74 miles - 4"
7.14 miles - 3"
3.15 miles - 2" 928.43 miles

Northern Natural Gas

433.94 miles - 30"
325.02 miles - 26"
228.98 miles - 24"
332.97 miles - 20"
349.62 miles - 16"
45.78 miles - 12"
237.19 miles - 10"
195.22 miles - 8"
610.56 miles - 6"
649.95 miles - 4"
517.21 miles - 3"
352.58 miles - 2" 4,279.09 miles 5,794.66 miles

UTILITIES (INVESTOR OWNED)

Great River Gas

1.20 miles - 8"
10.80 miles - 6"
12.77 miles - 4" 24.77 miles

PIPELINE MILEAGE

NATURAL GAS

UTILITIES (INVESTOR OWNED) (Cont'd.)

Interstate Power

1.00 miles - 16"
4.00 miles - 12"
10.49 miles - 8"
0.02 miles - 6"
8.55 miles - 4"
5.95 miles - 2"
2.50 miles - 1"   32.51 miles

Iowa Electric

2.00 miles - 8"
37.30 miles - 6"
99.96 miles - 4"
14.53 miles - 3"
40.00 miles - 2"   193.79 miles

Iowa-Illinois

41.42 miles - 16"
18.10 miles - 12"
104.53 miles - 10"
38.87 miles - 8"
37.48 miles - 6"
80.28 miles - 4"
65.64 miles - 3"
10.00 miles - 2"
5.06 miles - 1"   401.38 miles

Iowa Power

7.00 miles - 16"
15.00 miles - 8"
17.01 miles - 6"
12.69 miles - 4"
30.62 miles - 3"
37.12 miles - 2"   119.44 miles

Iowa Public Service

3.66 miles - 16"
4.69 miles - 10"
0.40 miles - 8"
0.04 miles - 6"
0.02 miles - 4"   8.81 miles

Iowa Southern

22.58 miles - 4"
31.48 miles - 3"
23.68 miles - 2"   77.74 miles

PIPELINE MILEAGE

NATURAL GAS

UTILITIES (INVESTOR OWNED) (Cont'd.)

North Central Public Service

2.32 miles - 6"		
10.25 miles - 3"		
8.00 miles - 2"	20.57 miles	

Peoples Natural Gas

8.70 miles - 4"		
30.30 miles - 3"		
8.02 miles - 2"	47.02 miles	926.03 miles

UTILITIES (MUNICIPALLY OWNED)

Bedford	15.66 miles - 3"			
Brighton	14.09 miles - 2"			
Clearfield	6.50 miles - 2"			
Corning	9.50 miles - 4"			
Lenox	21.00 miles - 4"			
Montezuma	14.70 miles - 4"			
	4.70 miles - 3"			
Morning Sun	1.34 miles - 2"			
	2.00 miles - 1"			
Moulton	5.10 miles - 2"			
Tipton	0.26 miles - 4"			
Wayland	10.40 miles - 2"			
Wellman	7.40 miles - 3"			
Winfield	4.62 miles - 2"	117.27 miles	117.27 miles	6,837.96 miles

APPENDIX C

NATURAL GAS PIPELINE COMPANY'S STORAGE SERVICES

Storage Service [S-1]

S-1 is available to DMQ-1 purchasers. Separately purchased DMQ-1 volumes are injected into Natural storage facilities. Volumes injected are withdrawn for use between November 1 and April 30. S-1 is billed according to a two-part rate. The basic monthly demand charge is composed of: (1) the Section 3.2 Demand Charge applied to the maximum daily withdrawal quantity; and (2) the Section 3.3 Storage Capacity Charge applied to 45 times the maximum daily withdrawal quantity.[A]

The basic monthly commodity charge is composed of: (1) the Section 3.4 Volume Injection rate applied to the volume injections in that month; and/or (2) the Section 3.5 Volume withdrawal rate applied to the volume withdrawals in that month.

Storage Service [MS-1]

MS-1 is available to DMQ-1 or G-1 purchasers. Separately purchased DMQ-1 or G-1 volumes are transported and injected into Michigan-Wisconsin Pipeline Company storage facilities (based on a transportation and storage agreement between Natural and Michigan-Wisconsin). Volumes injected are withdrawn for use between November 1 and February 28. MS-1 is billed by Natural according to a one-part demand rate. The basic monthly demand charge is the Section 3 Demand Charge applied to the maximum daily withdrawal quantity.[B]

[A] This basic monthly demand charge is decreased or increased according to any deficiency in withdrawal deliveries by Natural, or any requested withdrawal deliveries in excess of the maximum daily withdrawal quantity, respectively.

[B] This basic monthly demand charge is decreased or increased according to any deficiency in withdrawal deliveries by Natural, or any authorized overrun withdrawal deliveries in excess of the maximum daily withdrawal quantity, respectively.

Storage Service [MS-2]

MS-2 is available to DMQ-1 or G-1 purchasers. Separately purchased DMQ-1 or G-1 volumes are transported and injected into Michigan-Wisconsin Pipeline Company storage facilities (based on a transportation and storage agreement between Natural and Michigan-Wisconsin, different from the agreement upon which MS-1 is based). Volumes injected are withdrawn for use between November 21 and February 28. MS-2 is billed by Natural according to a one-part demand rate. The basic monthly demand charge is the Section 3 Demand Charge applied to the maximum daily withdrawal quantity.[C]

Storage Service [MS-3]

MS-3 is available to DMQ-1 or G-1 purchasers. Separately purchased DMQ-1 or G-1 volumes are transported by Michigan-Wisconsin Pipeline Company to Michigan Consolidated Gas Company storage facilities (based on a transportation agreement between Natural and Michigan-Wisconsin, and on a storage agreement between Natural and Michigan Consolidated). Volumes injected are withdrawn for use between November 1 and March 31. MS-3 is billed by Natural according to a one-part demand rate. The basic monthly demand charge is the Section 3 Demand Charge applied to 1/12 the sum of the maximum monthly withdrawal quantities.[D]

[C] This basic monthly demand charge, in a given month, can be: (1) decreased or increased according to any deficiency in withdrawal deliveries by Natural, or any requested withdrawal deliveries in excess of the maximum daily withdrawal quantity, respectively; (2) increased according to any additional volumes provided by Natural, at the request of the purchaser, to compensate for injection volume deficiencies by the purchaser; and/or (3) increased according to any requested withdrawal deliveries which exceed both the maximum daily withdrawal quantity and the maximum withdrawal quantity for the withdrawal period.

[D] This basic monthly demand charge is decreased according to any deficiency in withdrawal deliveries by Natural.

Storage Service [LS-1]

LS-1 is available to DMQ-1 or G-1 purchasers. Separately purchased DMQ-1 or G-1 volumes are injected into Natural storage facilities. Volumes injected are withdrawn for use between December 1 and March 31. LS-1 is billed according to a one-part demand rate. The basic monthly demand charge is the Section 3 Demand Charge applied to the maximum daily withdrawal quantity.[E]

Storage Service [LS-2]

LS-2 is the same as LS-1 above, only charged according to different tariff rates.

Storage Service [LS-3]

LS-3 is available to DMQ-1 or G-1 purchasers. Separately purchased DMQ-1 or G-1 volumes are injected into Natural storage facilities. Volumes injected are withdrawn for use between November 1 and March 31. LS-3 is billed according to a one-part demand rate. The basic monthly demand charge is the Section 3 Demand Charge applied to the maximum daily withdrawal quantity.[F]

E. This basic monthly demand charge is: (1) decreased according to any deficiency in withdrawal deliveries by Natural; and/or (2) increased according to any additional volumes provided by Natural, at the request of the purchaser, to compensate for injection volume deficiencies by the purchaser.

F. This basic monthly demand charge is decreased according to any deficiency in withdrawal deliveries by Natural.

```
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                  PLOTS FOR THE FULL 1969 THRU 1980 DATASET                                 1
                                                                8:29 THURSDAY, JUNE 24, 1982
                  PLOT OF RGPR_R*WTWHPR_R    SYMBOL IS VALUE OF UTIL
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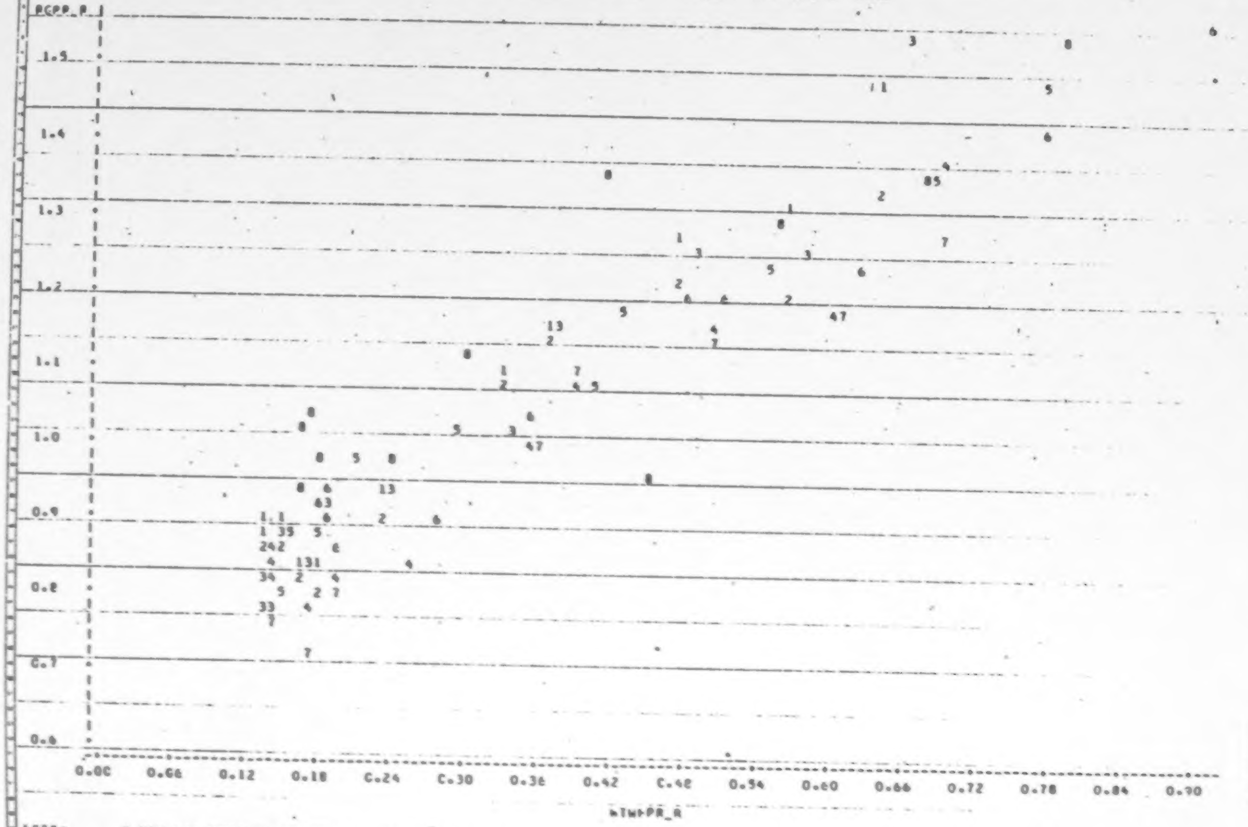

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NOTE:   2 OBS HAD MISSING VALUES     18 OBS HIDDEN
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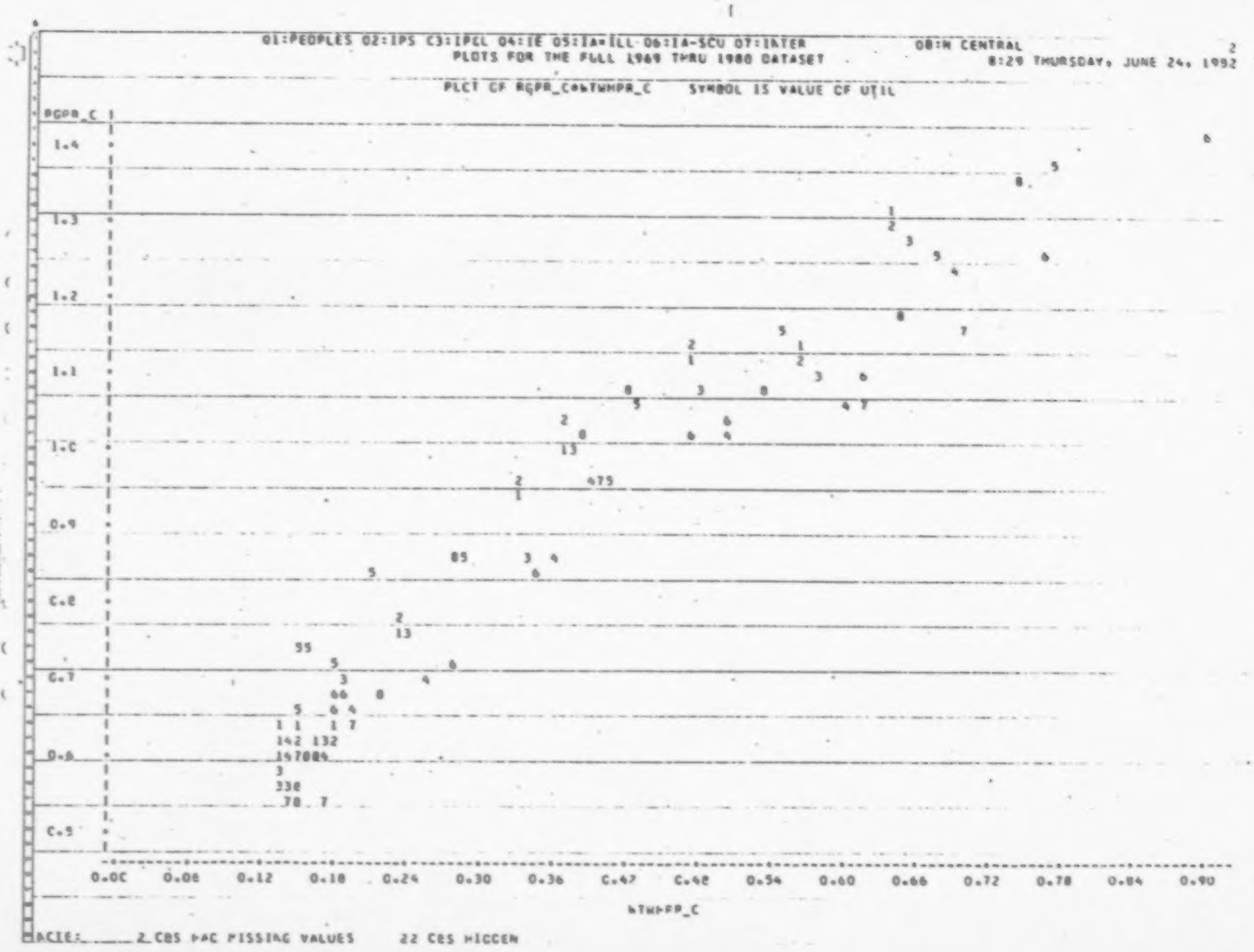
EXHIBIT 1



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NOTE: 2 OBS HAD MISSING VALUES     22 OBS HIDDEN
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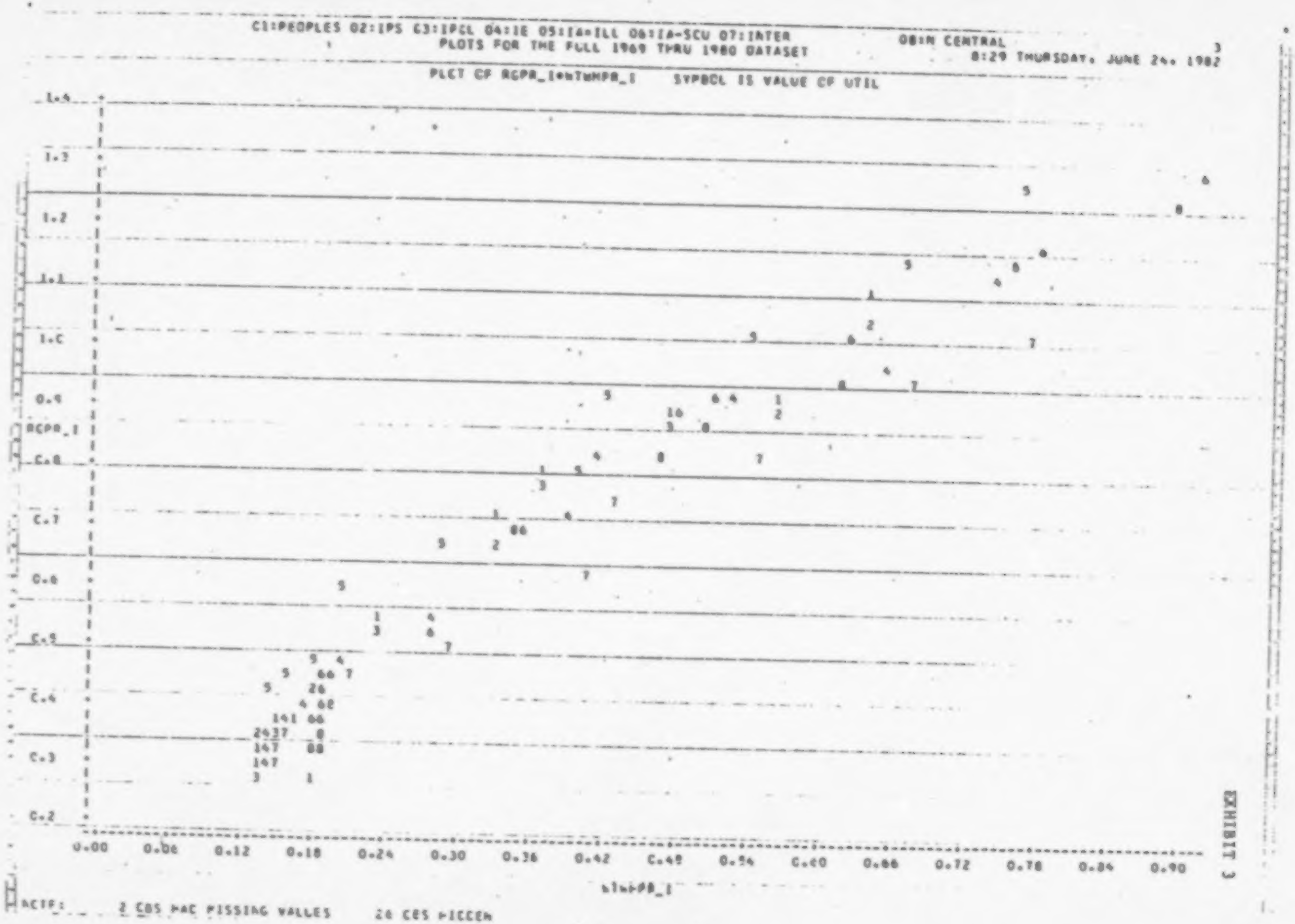
EXHIBIT 2



C1:PEOPLES 02:IPS 03:IPCL 04:IE 05:IA-ILL 06:IA-SCU 07:INTER 08:N CENTRAL

PLOTS FOR THE FULL 1969 THRU 1980 DATASET

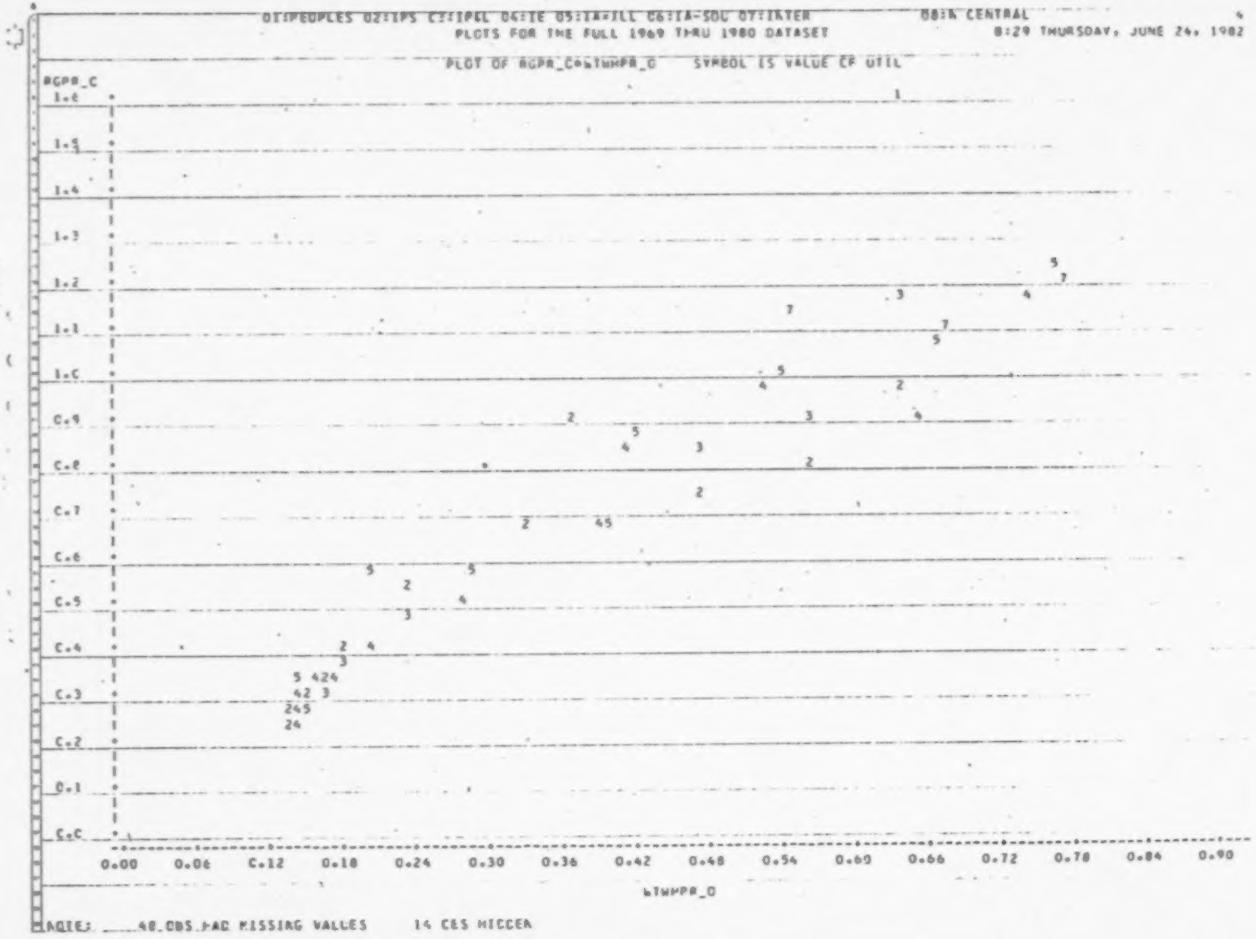
8:29 THURSDAY, JUNE 24, 1982 3

PLOT OF RCPR_I*NTWMPR_I SYMBOL IS VALUE OF UTIL

NOTE: 2 OBS HAD MISSING VALUES 26 OBS HIDDEN

EXHIBIT 3

EXHIBIT 4



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                   PLOT OF RGPR_C*WTWMPR_O     SYMBOL IS VALUE OF UTIL

NOTE:    48 OBS HAD MISSING VALUES      14 OBS HIDDEN
```

EXHIBIT 5

```
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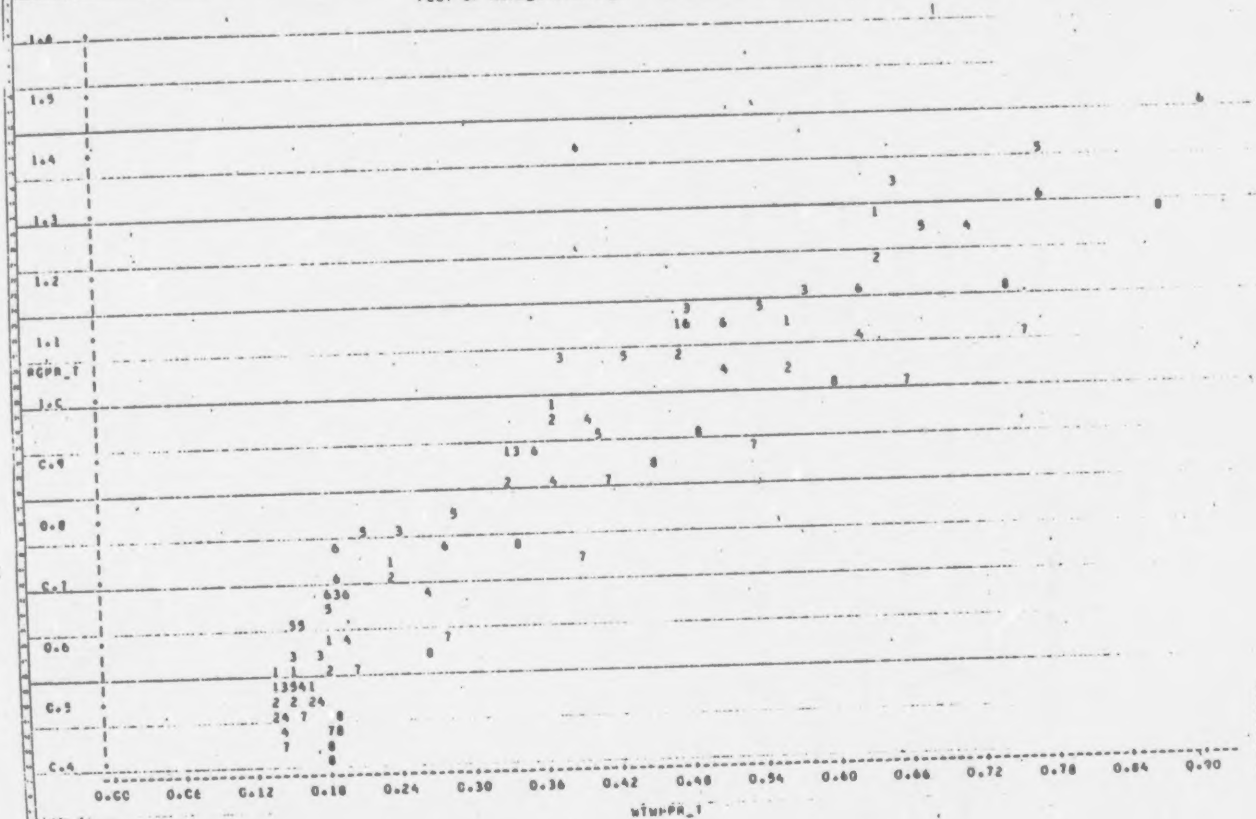
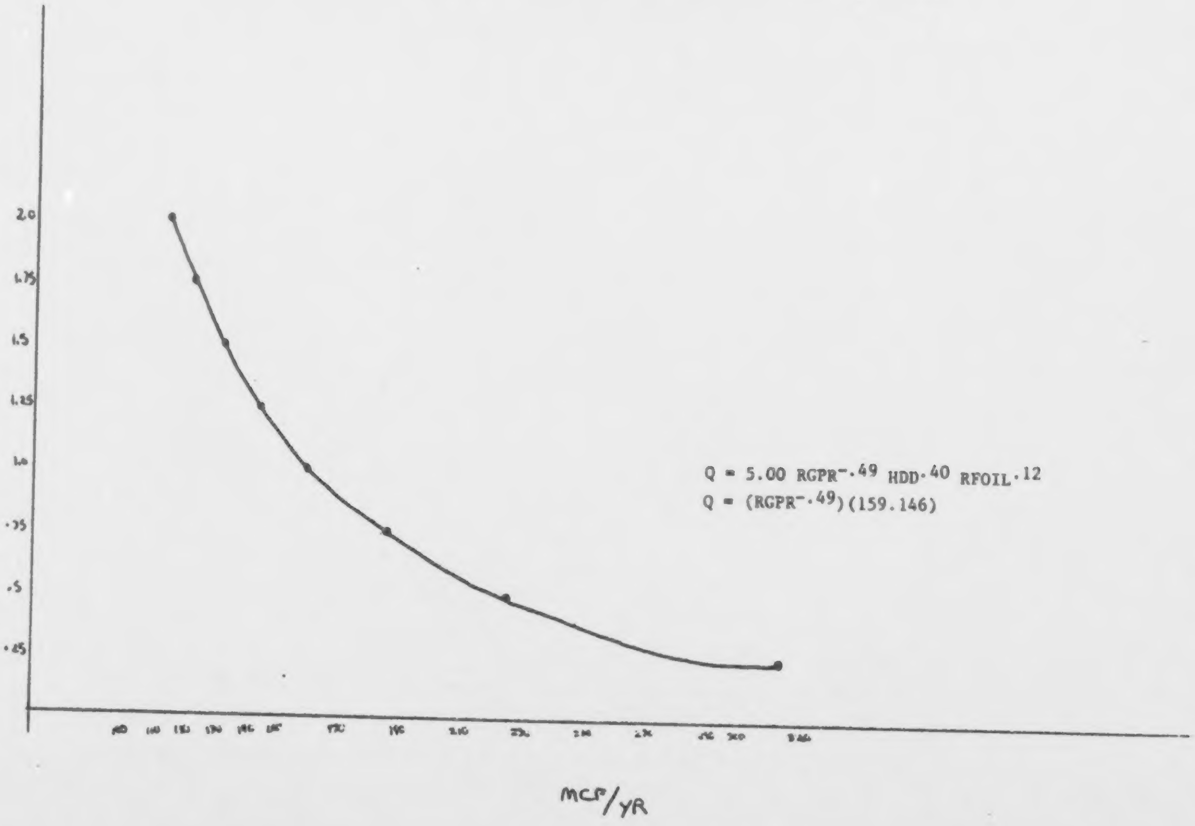


```
NOTE:    2 OBS HAD MISSING VALUES     14 OBS HIDDEN
```

Attachment

To provide a visual representation of the results of the real retail price models and of the real well-head price models, representative demand curves resulting from these models were developed. Iowa Electric usage data were used. The results are based on the total models, which provide estimates of yearly natural gas sales per customer, where "customers" are simply Iowa Electric's total number of gas customers. In preparing these demand curves, 1969-81 average heating degree days were used along with the 1981 index of real fuel oil prices. Of course, if heating degree days or real fuel oil prices were higher, there would be horizontal outward shifts in the demand curve.

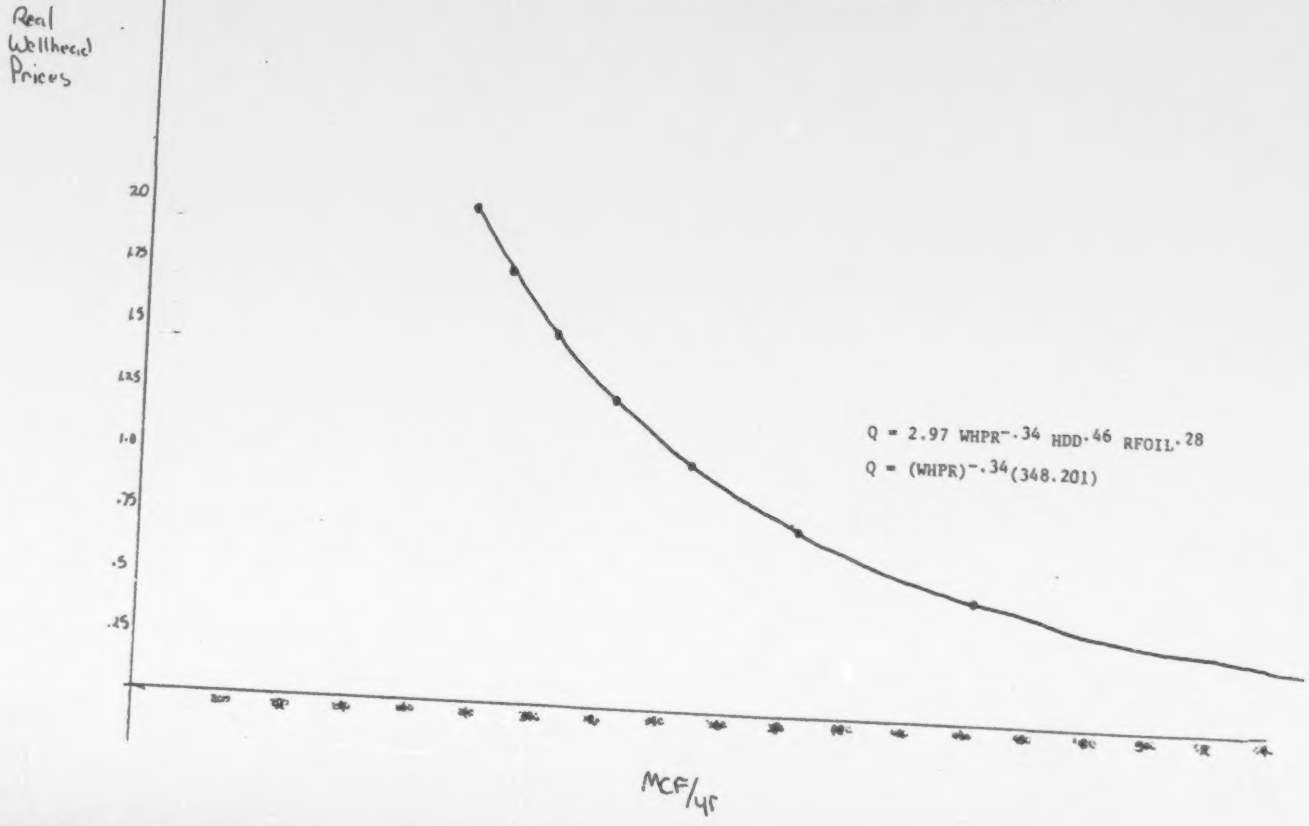
Retail Rate
Iowa Electric Light & Power Company Predicted Demand Curve
for Yearly Natural Gas Usage Per Total Customer
(All Prices in Real 1967 terms)
(Average Yearly Heating Degree Days and 1981 Real Fuel Oil Prices Assumed)



$Q = 5.00\ RGPR^{-.49}\ HDD^{.40}\ RFOIL^{.12}$

$Q = (RGPR^{-.49})(159.146)$

Wellhead Price
Iowa Electric Light & Power Company Predicted Demand Curve
for Yearly Natural Gas Usage Per Total Customer
(All Prices in Real 1967 terms)
(Average Yearly Heating Degree Days and 1981 Real Fuel Oil Prices Assumed)



Senator JEPSEN. Thank you. I would like to move along and make sure that all the panelists have adequate time. I will now welcome Dean Kleckner, president of the Iowa Farm Bureau.

I can remember, Dean, in 1976–77 I used to visit those areas quite frequently where we had some grain elevators. There were piles of grain on the ground to be dried and the dryers were running out of natural gas in some areas. As you know, a grain that is put in big piles and stored, with the high moisture for too long a time, is in danger of spoiling, or in danger of starting a fire. It's a loss of dollars and a lot of other things, and there were times when in those days we didn't have enough natural gas and they had to shut those dryers off. In fact, they didn't have to shut them off; the gas was shut off. You may proceed, Mr. Kleckner.

STATEMENT OF DEAN KLECKNER ON BEHALF OF THE IOWA FARM BUREAU FEDERATION, DAVENPORT, IOWA

Mr. KLECKNER. Thank you, Senator, and I appreciate the fact that you are having this hearing on this matter. I am Dean Kleckner. I farm in north-central Iowa at Rudd, and I serve as president of the Iowa Farm Bureau Association, and I'm testifying on behalf of our 150,000 farm-family members of our Farm Bureau Federation. I commend you Senator, and I do remember those days that you spoke of because my co-op elevator was shut off.

We do have an interest in our Nation's future natural gas policy decisions. We not only rely on gas to heat our homes and dry our crops, but natural gas is a vital raw material for the production of fertilizers and farm chemicals. I'm not going to read everything in of because my co-op elevator was shut off.

Prior to the enactment of the Natural Gas Policy Act, our Nation was in a desperate search for new sources of natural gas. The artificially low price of natural gas over-stimulated the demand for the product. The gradual decontrol of some production under the NGPA has resulted in an expansion of supply and reserves, and we've already heard that documented today. In Iowa now, the present availability of natural gas far outdistances the demand. Now, as I go on in the bottom of that paragraph I say that we Iowans have reacted to market pressures in that we have just simply cut back. However, just as the farm economy has not been the perfect market as envisioned by Adam Smith, so too has the market for natural gas been unduly influenced by Government intervention and take-or-pay clauses inserted in producer pipeline long-term contracts. Each of these influences has caused an imbalance in the working of the market system.

At our recently conducted meeting of the Farm Bureau Federation in Dallas, we adopted a policy which states in part—and I go down to the middle of the paragraph—"Government regulations and punitive taxes levied on energy producers only serve to make the United States more dependent on foreign nations to supply our energy needs," and I believe the basic part of our policy is what I have underlined. "We support deregulation of natural gas prices. We support legislation which will permit natural gas transmission lines to renegotiate take-

or-pay contracts that artificially inflate the price of such gas." We believe that the free-market system is the best allocator of energy resources and the best provider of incentives for energy development and conservation.

Some analysts predicted astronomical price increases with the phased removal of price controls on crude oil. With price control on crude oil completely eliminated in January 1981, and with consequent reliance on the market system for pricing, the Nation has seen crude oil prices stabilized, and recently, actually falling. U.S. production has stabilized from its long decline, and conservation has been encouraged. And, given the current inability of the OPEC nations to effectively control the price and quantity of oil each of its members produce, we may see a further decline in the price of oil, and I believe we are seeing it today.

As natural gas prices are decontrolled, a similar outcome may result. Natural gas is a basic energy source and is a close substitute for other fuels. Its price will be influenced by the cost of our energy sources. Many industrial users presently have the capability to readily switch from natural gas to oil. This ability will force natural gas producers to competitively market their product so as not to price themselves out of a substantial share of the energy market, and I quote two people there, and that's included in this as an appendage that, "The majority view today is that the value of gas in an unregulated market is determined by the cost of substituting residual fuel oil for industrial and electric utility use."

While the price of natural gas will be influenced and determined by many factors, we must not neglect situations wherein pipeline companies are in a monopoly or near-monopoly position. Most Iowa communities have but one pipeline supplying its natural gas and at present there is no suitable substitute for natural gas for the production of nitrogen fertilizer. Care must be taken in these situations to assure that the pipeline companies do not abuse their advantageous bargaining position to the detriment of captive consumers. Caution must also be exercised so that producers facing a pipeline monopoly will receive a fair return on their investment.

I point out then that the American Farm Bureau Economic Research Division published a report less than a year ago that explored the effect deregulation would have on the cost of anhydrous ammonia. Nearly 95 percent of the anhydrous ammonia produced in the United States uses natural gas in its manufacture. The price of natural gas used in this process will be influenced by the cost of other energy sources I've already mentioned.

Now, at least one study has predicted huge increases in the price of nitrogen fertilizer when natural gas prices are decontrolled, but these estimates were based on the assumption of $50-a-barrel crude oil. I want to make this very clear, that those $600 and $800 prices per ton of anhydrous ammonia that we hear about are really speculative today in view of today's energy situation. Let's assume that there would be some increase from the 1982 estimate to $255 per ton. What would be the effect on the farmer? And I suggest in 1983 it's going to be less.

Our research economists postulate that using current average nitrogen application rates, the cost of production would increase. They further state that even if prices rise to cover the extra cost, farmers will use less fertilizer simply because it improves profits. There are other circumstances that are coming into play. Assuming then that product price increases match the ammonia price increase, we believe, and I believe, the nitrogen fertilizer use will decline. I don't believe we are going to be using the amounts in the future that we are using now. Reduced nitrogen use will reduce expenses and reduce yields. The reduced production will strengthen prices, and with higher nitrogen prices there will be new incentives to improve the efficiency of nitrogen application. All we're talking about here, Senator, is a market system at work.

Now, going on, the study that our staff conducted was prior to the announcement of the PIK program, the crop swap. Participation in this program will idle row-crop ground, thereby further reducing the demand for nitrogen fertilizer. Again, I predict that there will be real bargains on anhydrous ammonia and chemicals as we have less acres and we have suppliers fighting for the market that remains.

We are going to react to increases in gas prices in other ways as well, and I list there six ways that I see that farmers will react to higher gas prices. We're going to use more soil testing and analysis of fertilizer requirements for various crop alternatives. This is going to lead to more efficient use of nitrogen fertilizer and other fertilizers. There will be an increased demand for technology that will enhance efficient use of fertilizer. Senator, I remember back when nitrogen was 7 or 8 cents a pound and we just poured it on as we saw fit and if some escaped from the soil because it was a little too wet or cold it didn't bother me. It does bother me now, and we have better equipment. So that is a function of price on the market, the improved equipment and cutting back a little bit and more efficiently using what's there.

Same thing with natural gas, LP gas in my case on the farm. When the price goes up I look for more efficient ways to utilize that. Increased use of legume coverage crops which produce nitrogen that can be used by succeeding crops. We'll be seeing that this year with the crop swap or the PIK program. We're going to be sowing alfalfa and sweet clover and putting back 80 pounds per acre that we won't have to buy next year or the year after. We're going to see some reduction in irrigation. Not a matter in Iowa, but much of the Nation uses a lot of irrigation, and a lot of gas is used in that irrigation process of driving those engines. We are adding insulation and weather stripping to buildings and homes heated with gas and other energy sources right now. Some switching to supplemental solar heat for low temperature grain drying to replace natural gas or LP. Use of heat lamps, electricity, as a substitute for heated farrowing houses as a substitute for gas.

While none of the above adjustments alone will offset the expected price increase, when these alternatives are totaled, a market price impact will certainly be realized, and I think Ms. Hansen's comments on the declining-use point to some of that that has been in the farm in the rural areas as we are doing these things.

Some fear that natural gas prices will fly up in 1985 when most sources of natural gas are deregulated. However, assertions by economists and others have lessened the fear of a fly-up. In fact, some have stated that the price of natural gas has indeed reached the market-clearing level. Ms. Hansen, I do believe we have reached market levels now.

Issues of supply and deregulation of gas have been in the past few months put on th back burner in Iowa, and the subject of long-term producer pipeline contracts containing take-or-pay clauses have come to the fore.

Take-or-pay contract clauses were included in producer pipeline contracts at a time when there was a perceived shortage in the supply of natural gas. I won't go on here because our previous panel has already covered the take or pay.

As I close out my comments I quote Christine Hansen in her testimony before the Federal House Subcommittee on Fossil and Synthetic Fuels, and I would just like to go down, if you have a copy of my testimony, Senator, toward the bottom, what we would want you to do. We urge the Joint Economic Committee to seriously consider immediate deregulation of all natural gas prices and legislation that will permit natural gas transmission lines to renegotiate those contract clauses. I quote Milton Copulos, director of studies at the Heritage Foundation, "If there is one lesson to be learned from the history of natural gas regulation in the United States, it is that the market works best." And something that's not on there, a quote from Dean Kleckner, "There is no shortage of anything anywhere in the world where the market sets the price."

Senator, I have asked economists of noted scope if that's a true statement and no one disagrees. Shortages don't exist where the market sets the price. Thank you.

[The prepared statement of Mr. Kleckner, on behalf of the Iowa Farm Bureau Federation, follows:]

PREPARED STATEMENT OF DEAN KLECKNER ON BEHALF OF THE IOWA FARM BUREAU FEDERATION

On behalf of the 150,000 farm family members of the Iowa Farm Bureau Federation, I would like to express my appreciation to the Joint Economic Committee, and its chairman, Senator Roger Jepsen, for the opportunity to comment on our nation's natural gas supply and marketing situation. My name is Dean Kleckner. I am a farmer from Rudd, Iowa, and have had the honor of serving as a president of the Iowa Farm Bureau Federation since December, 1975.

Iowa farmers have an interest in our nation's future natural gas policy decisions. We not only rely on gas to heat our homes and dry our crops, but natural gas is a vital raw material for the production of fertilizers and farm chemicals.

Prior to the enactment of the Natural Gas Policy Act (NGPA), our nation was in a desperate search for new sources of natural gas. The artificially low price of natural gas over-stimulated the demand for the product. The gradual de-control of some production under the NGPA has resulted in an expansion of supply and reserves. In Iowa, the present availability of natural gas far out-distances the demand. Since 1974, according to Iowa state commerce commission figures, the total amount of natural gas consumed in Iowa has steadily declined, while the total revenue from the sale of natural gas has sky rocketed.(1) Due to the dramatic increase in price, Iowans have greatly increased their appreciation for, and use of, energy conservation measures. Simply stated, Iowans have reacted to market pressures.

However, just as the farm economy has not been the perfect market as envisioned by Adam Smith, so too has the market for natural gas been unduely influenced by government intervention and take-or-pay clauses inserted in producer-pipeline long-term contracts. Each of these influences has caused an imbalance in the working of the market system.

At the 1983 American Farm Bureau Federation convention, the delegates adopted a resolution on energy which states in part:

"It is imperative to the nation's long-term best interest that government and private industry work cooperatively and immediately to develop all possible sources of energy. Bureaucratic interferences in the energy market should be eliminated. Government regulations and punitive taxes levied on energy producers only serve to make the United States more dependent on foreign nations to supply our energy needs. Congress should encourage capital investment for the development of domestic oil and gas exploration by the competitive enterprise system and deregulation. We support deregulation of natural gas (prices). We support legislation which will permit natural gas transmission lines to renegotiate take-or-pay contracts that artificially inflate the price of such gas."

We believe that the free market system is the best allocator of energy resources and the best provider of incentives for energy development and conservation.

Some analysts predicted astronomical price increases with the phased removal of price controls on crude oil. With price control on crude oil completely eliminated in January 1981, and with consequent reliance on the market system for pricing, the nation has seen crude oil prices stabilized, and recently, actually falling. U.S. production has stabilized from its long decline and conservation has been encouraged. And, given the current inability of the OPEC nations to effectively control the price and quantity of oil each of its members produce, we may see a further decline in the price of oil.

As natural gas prices are decontrolled, a similar outcome may result. Natural gas is a basic energy source and is a close substitute for other fuels. Its price will be influenced by the cost of other energy sources. Many industrial users presently have the capability to readily switch from natural gas to oil. This ability will force natural gas producers to competitively market their product so as not to price themselves out of a substantial share of the energy market. According to Arlon Tussing and Connie Barlow, in an article published by the Public Utility Fortnightly, "The majority view today is that the value of gas in an unregulated market is determined by the cost of substituting residual fuel oil (for) industrial and electric utility (use)."(2)

While the price of natural gas will be influenced and determined by many factors, we must not neglect situations wherein pipeline companies are in a monopoly or near monopoly position. Most Iowa communities have but one pipeline supplying its natural gas and, at present, there is no suitable substitute for natural gas for the production of nitrogen fertilizer. Care must be taken in these situations to assure that the pipeline companies do not abuse their advantageous bargaining position to the detriment of captive consumers. Caution must also be exercised so that producers facing a pipeline monopsony will receive a fair return on their investment.

The American Farm Bureau Federation Economic Research Division published a report in the March 8, 1982, Farm Bureau News, exploring the effect of deregulation on the cost and use of nitrogen fertilizer.

Nearly 95 percent of the anhydrous ammonia produced in the United States uses natural gas for its manufacture. The price of natural gas used in this process will be influenced by the cost of other energy sources, as I have already mentioned.

At least one study has predicted huge increases in the price of nitrogen fertilizer when natural gas prices are decontrolled.(3) These estimates, however, were based on assumption of $50 barrel crude oil. This assumption is quite speculative in view of today's energy situation.

However, let us nevertheless assume that there would be some increase in the cost of nitrogen fertilizer from the 1982 estimate of $255 per ton. What would be the affect on farmers?

The American Farm Bureau Research Division economists postulate that using current average nitrogen application rates, the cost of production would increase. They further state that even if prices rise enough to cover the extra cost, farmers will use less fertilizer simply because it improves profits. Income maximizing producers will increase nitrogen costs until the cost of additional fertilizer needed to produce an additional bushel of grain is equal to the value of that additional bushel. Unless product price increases match the ammonia price increase, nitrogen fertilizer use will decline. Reduced nitrogen use will reduce expenses and reduce yields. The reduced production will strengthen prices. With higher nitrogen prices, there will be new incentives to improve the efficiency of nitrogen application.

Furthermore, the study of the AFBF staff was conducted prior to the announcement of the PIK program. Participation in this program will idle row crop ground, thereby further reducing the demand for nitrogen fertilizer.

The farm community will react to increases in gas prices in other ways as well. The responses will take to forms of:

1. More soil testing and analysis of fertilizer requirements for various crop alternatives. This will likely lead to more efficient use of nitrogen fertilizer and other fertilizers. There will be an increased demand for technology that will enhance the efficient utilization of fertilizer;

2. Increased use of the legume cover crops which produce nitrogen that can be used by succeeding crops;

3. Some reduction in irrigation and a search for techniques to improve irrigation efficiency;

4. Add insulation and weather stripping to buildings heated with gas;

5. Some switching to supplemental solar heat for low temperature grain drying to replace natural gas or LP gas; and

6. Use of heat lamps (electricity) as a substitute for heated farrowing houses.

While none of the above adjustments alone will offset the expected price increase, when these alternatives are totaled, a market price impact will certainly be realized.

Some fear that natural gas prices will "fly up" in 1985 when most sources of natural gas are deregulated. However, assertions by economists and others have lessened the fear of a "fly up". In fact, some have stated that the price for natural gas has indeed reached the market clearing level.(4)

Issues of supply and deregulation of natural gas have been, in the past few months, put on a backburner in Iowa, and the subject of long-term producer pipeline contracts, containing take-or-pay clauses, have come to the fore.

Take-or-pay contract clauses were included in producer pipeline contracts at a time when there was a perceived shortage in the supply of natural gas. These contract clauses dictate that pipeline companies agree to buy a certain percentage of newly found gas. In order to take the amount of gas contemplated by these clauses, pipeline companies have cut back the purchase of "old" cheaper gas. Today's supply of natural gas and the demonstrated ability of the natural gas consumer to react to market pressures, lead to the conclusion that these clauses are but another market skewing device.

Commissioner Christine Hansen of the Iowa state commerce commission, in her testimony before the House Subcommittee on Fossil and Synthetic Fuels, stated,

"As we have seen with the Iowa experience, the Natural Gas Policy Act did solve the supply problem and did permit the market to react to real change in natural gas pricing. The existing long-term producer-pipeline contracts will prohibit efficient market reaction. Unless flexibility is forced into these long-term contracts, they will not reflect accurate demand and price levels in the future. The gluts of natural gas are not going away until contract inflexibility is mitigated."

We urge the Joint Economic Committee to seriously consider immediate deregulation of all natural gas prices, and legislation that will permit natural gas transmission lines to renegotiate these contract clauses.

Allow me to end my statement with a quote from Milton Copulos, Director of energy studies at the Heritage Foundation in Washington, D.C.,

"If there is one lesson to be learned from the history of natural gas regulation in the United States, it is that the market works best."(5)

Footnotes

[1] See testimony of Commissioner Christine Hansen before the House Subcommittee on Fossil and Synthetic Fuels, August 9, 1982, Appendix A.

[2] Arlon R. Tussing and Connie C. Barlow, "The Rise and Fall of Regulation in the Natural Gas Industry," Public Utilities Fortnightly, March 4, 1982, p.18.

[3] See, "The Impact of Old Gas Decontrol on Iowa's Farms," released by the Iowa Citizen/Labor Energy Coalition, September 12, 1982.

[4] See footnotes 1 and 2.

[5] Milton Copulos, "The Controls Are On You," Inquiry, August 1982, p. 33.

Other References

Barry P. Brownstein, "Natural Gas: The Case For Immediate Deregulation," Policy Report (Cato Institute), August 1982.

Sheila S. Hollis and Paul E. Strohl, Jr., "Squaring the Circle: Implementing the Agricultural Use Exemption from Incremental Pricing Under the Natural Gas Policy Act," Natural Resources Lawyer, Vol. XV, No. 2, 1982.

Steve Mufson, "Gas Consumer Say Pipelines Are Paying More Than Necessary for Their Supplies," Wall Street Journal, November 11, 1982, p. 46.

Natural Gas Policy Task Force of the Iowa State Commerce Commission, Revised First Report, August 4, 1982.

William Baldwin, "Paying the Piper," Forbes, November 22, 1982, pp. 42-43.

Senator **Jepsen**. Now I will recognize John Daniel of Iowa-Illinois Gas & Electric. Welcome, John, you may proceed.

STATEMENT OF JOHN DANIEL, VICE PRESIDENT-OPERATION, IOWA-ILLINOIS GAS & ELECTRIC CO.

Mr. **Daniel**. We appreciate the opportunity to make a statement before this committee. My name is John Daniel, and I am vice president-operation for Iowa-Illinois Gas & Electric Co.

In the structure of the gas industry we are a distributing company, and many of our customers, I'm afraid, don't fully comprehend that. We do not produce gas, neither do we transmit it. We distribute natural gas to about 225,000 customers in the Quad Cities, Iowa City, Cedar Rapids, Fort Dodge, Ottumwa, and several smaller municipalities. At each city we have only one available pipeline supplier. In the Fort Dodge area the supplier is Northern Natural Gas Co. In each of the other areas it is Natural Gas Pipeline Co. of America. They are not common carriers, but sell us gas they have under contract at rates set by the Federal Energy Regulatory Commission.

Our goal at Iowa-Illinois is for our customers to have a dependable supply of natural gas at an affordable price. In an effort to accomplish this objective, our company is in frequent communication with its suppliers as to our supply requirements and the price of gas. We participate in hearings before the Federal Energy Regulatory Commission regarding rate increases of our pipeline suppliers, particularly with regard to matters of rate design. We take this action to protect the interests of the company, which are also our customers' interests. The rates paid to producers by the pipeline companies currently are established by the Federal Energy Regulatory Commission and by Congress through the enactment of the Natural Gas Policy Act.

Pipeline and producer costs represent about 80 percent of the retail customer's bill. The producer costs alone represent about 60 percent of the bill, and it has been this component of the cost which has been increasing at the greatest rate in recent years and is largely responsible for the significant increases in gas prices.

At Iowa-Illinois, as Commissioner Hansen has indicated, in regard to Iowa we are fortunate that the price we pay for natural gas is well below the national average. We purchase the gas requirements for most of our service territory, as I indicated earlier, from Natural Gas Pipeline Co. of America, a pipeline company currently with the second lowest cost of gas among the 26 major pipelines in this country. This has led to residential rates which in 1982 were 9 percent below the national average.

The real price of natural gas for residential use has risen 55 percent since 1960. That increase is due to the conscious national decision to decontrol the price of gas at the wellhead to assure an adequate supply and let it rise to its true competitive value. In real terms, with the cost of gas reflecting the costs we as a distributing company control, has declined 34 percent since 1960.

The level at which natural gas should be priced is a complex issue. The balance between supply and price is very delicate. Earlier regulation kept wellhead prices so low that severe shortages and curtailments were experienced during the 1970's. Had the price of natural gas been permitted to rise to its true competitive value in other years, many of the conservation measures being undertaken would have been in place. As a result, customer bills likely would have been less and supply ample.

Iowa-Illinois, along with other gas distributors, has spent considerable time and effort to combat actions that might lead to unnaturally high gas costs. Iowa-Illinois has joined with other gas utilities in urging the Federal Energy Regulatory Commission to curb escalating gas prices, and we have urged congressional action which may be necessary to deal with pricing problems in the short run. We must, however, proceed with caution lest action be taken that will be necessary again.

In the longer run, we believe the marketplace should determine the price of natural gas. Natural gas is in competition with oil and must respond to changes in oil prices which would materially affect gas sales. We are seeing an increasing trend by industrial customers to switch from natural gas to oil, or, where possible, to coal. As industrial sales are lost, an even heavier burden falls on the distribution company and its residential and small commercial consumers. Regulation has difficulty responding to the changing market conditions in a timely manner. We do not believe that extending wellhead price controls beyond the existing legislative period is in the best interests of our customers.

We are very concerned with rising gas prices and the impact on customers. We also recognize that contracts with gas producers having clauses that now contribute to an undesirably high gas price were entered into with good intention, and I'll not go into them. They have been discussed by other panelists. Some contracts with producers are being renegotiated to modify such troublesome contract terms as has been indicated previously. We urge and support such negotiations. Increases in gas prices appear to be moderating, and we believe they will continue to moderate as long as oil prices remain relatively stable. However, we believe the gas industry and Federal agencies should work together for a solution that would slow down the spiraling cost of gas, but which would be fair for the producers and the pipeline companies. That concludes my statement.

Senator JEPSEN. Thank you, John. Now, to move along, I would ask Linda Blanchard and Gordon Dunn to come to the table and I understand you both have some statement you would like to make.

Ms. BLANCHARD. Right.

Senator JEPSEN. You may proceed.

STATEMENT OF LINDA BLANCHARD, PRESIDENT, IOWA CITIZENS FOR COMMUNITY IMPROVEMENT, DES MOINES, IOWA

Ms. BLANCHARD. Thank you, Senator. Senator Jepsen, members of the Joint Economic Committee, ladies and gentlemen, thank you for the opportunity to present testimony on behalf of the Iowa Citizens for Community Improvement. Iowa CCI is a network of community organizations which include CCI groups in Cedar Rapids, Council Bluffs, Des Moines, Waterloo, and the Coalition for Community Reform in Sioux City.

Increasing numbers of Iowans are cold, hungry, and angry; 95,000 Iowans are now unemployed and seeking a job. Over 10,000 Iowa farmers are being forced by creditors to sell their land and/or equipment; 204,000 Iowans received food stamps in December; 80,000 Iowans applied for federally funded fuel assistance.

These figures are in striking contrast to the conditions reported by the utility companies, pipelines, and natural gas producers doing business in Iowa. Iowa Resources, parent company of Iowa Power & Light, reports a net 1982 income of $36 million. InterNorth, parent company of Northern Natural and Peoples Natural Gas Co., experienced record profits in 1981, and earned $3.01 per share in 1982 despite holding out $64 million in the fourth quarter of 1982 for bad management decisions. Exxon, the Nation's largest natural gas producer, reported profits of $1.48 billion in the final 3 months of 1982; 20 corporations owned in excess of 70 percent of our natural gas supply. The board members of these corporations appoint each other to sit on the boards of the country's largest banks, insurance companies, and other major industries.

Low and moderate income families worry themselves sick, and in some cases to death, over basic survival decisions concerning food, shelter, health, and warmth. Meanwhile, corporation fat cats are flying to Jamaica and other warm places to plot additional ways to control our lives.

There is no economic justifiction for today's expensive natural gas prices. The consumer is at the mercy of the utilities, the pipelines, the producers, and State and Federal regulators. Iowa CCI insists that the State and Federal agencies and our elected representatives act in the best interest of the American people. This means saying no to the few greedy, powerful, middle-aged white men who sit on the boards of Exxon, Arco, Texaco, Standard, Shell, Mobil, and about 14 other companies who continue to put their regard for profits above our Nation's security and the well-being of people all over the world.

While we do believe in miracles, it is very doubtful that the Federal Energy Regulatory Commission, the U.S. Justice Department's Antitrust Division or other agencies charged with protecting the interests of the general public will take the corrective action necessary to put natural gas prices under responsible control.

Therefore, Iowa CCI joins with National Peoples' Action and other community groups from across the country in calling for the following comprehensive legislative changes:

One, extend controls on natural gas. Since big oil controls the supply, the Federal Energy Regulatory Commission should start controlling the price in the interest of the American people.

Two, place controls on all gas. The producers now cap cheap gas and intentionally dig deep wells in order to get the highest price.

Three, roll back prices on natural gas to the 1978 price levels. The political deal that was cut in 1978 in order to get the Natural Gas Policy Act through Congress has turned into a raw deal for the American people. Roll back prices in order to check the greed of the big oil companies.

Four, eliminate take-or-pay contracts. A thorough investigation of the producers and pipeline companies will reveal that their interests are so entwined that price-fixing and self-dealing practices are the rule, not the exception, in the contract negotiations.

Five, cap expensive gas and require pipelines to purchase the least expensive gas. This will encourage producers to make the least expensive gas available instead of the most expensive gas, the way the current system is working.

Six, eliminate indefinite escalator clauses. Producers should be allowed only those increases which can be justified by actual production costs, not irrelevant economic indicators.

Seven, shut the back door on FERC. The Federal Energy Regulatory Commission has tried to raise the ceiling prices on various categories of gas and decontrol other categories. FERC's authority to make rule changes which result in higher prices must be stopped.

Eight, ruling on purchase gas adjustments. Pipelines and utilities should not be allowed to collect PGA rate increases unless they are approved by FERC. No interim increases should be allowed.

It is time for our elected representatives to stand up to the big oil corporations and stand up for the American people. Iowa CCI calls for immediate and comprehensive action to stop the fraud and abuse which is causing so many people to suffer while a privileged few gain. Thank you.

Senator JEPSEN. Thank you. Gordon Dunn, now, from CCI.

STATEMENT OF GORDON DUNN, VICE PRESIDENT, CITIZENS FOR COMMUNITY IMPROVEMENT, CEDAR RAPIDS, IOWA

Mr. DUNN. Thank you for inviting us here to speak. I have an adaptation of remarks that I presented to the Federal Energy Regulatory Commission.

The decontrol of natural gas prices has been the goal of the fuel industry since long before the various energy crises. During the 1960's, the industry fought the development of pricing rules by the Federal Power Commission, even though gas discoveries and reserves had been constantly increasing. Then in 1968 the Supreme Court upheld the right of the Federal Power Commission to control the prices, along with the provision that the FPC would allow producers to increase the price of their gas whenever the gas association's figures showed that the rate of new discoveries has decreased.[1]

The gas association's figures soon began to show declining reserves. This data was very hard to verify because it was provided by the producers themselves and there were obvious incentives to fudge the figures. Thus, Congressman John Moss' Commerce subcommittee found that in the early 1970's the gas association had not reported 8.8 trillion cubic feet of discovered natural gas. Of course there are other reasons why the fuel industry might want higher prices. Most of the gas is produced by oil companies who also have substantial holdings in coal. These fuels will be much easier to sell at their present high prices if natural gas escalates to an equally expensive price.

In 1978 the petroleum industry achieved its goal with the aid of a very clear-cut political deal. Since all parties to this contract agreed that low- and moderate-income households would be hurt by steep price increases, the deal included a package of energy assistance, weatherization grants and low-interest loans for solar improvements. These programs were to be funded by part of the windfall profits tax, thus lessening the impact of this massive transfer of wealth from poor to rich.

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[1] "Who Owns The Earth", James Ridgeway, 1980, Public Resource Center.

The assault of the present administration on programs designed to help people who are trying to improve their homes has turned this arrangement into a raw deal. The administration has impounded and then reduced funding for low-income weatherization. These pseudoeconomists have slashed the financing of low-interest loans for home conservation and even attacked the tax credits for solar energy. At the same time, the Government has increased direct subsidies to the energy industry to a level of $10 billion a year. Along with ridiculously high interest rates, these so-called cutbacks are stripping natural gas consumers of their ability to cope with price increases. Since the administration and energy lobby have broken their contract with the American people, we demand that the increase in natural gas prices be rolled back to 1978 levels and the basic deal be renegotiated.

We come now to the role of the regulatory agency in energy policy. The bottom line of the regulatory process is to insure accountability and equity in situations which are not controlled by normal market forces. Wherever there is economic concentration in industry, there is even a partial monopoly, there should be close regulation, for without it the chances for abuse become facts of abuse.

Iowa CCI alleges collusion in the energy industry between producers and distributors of natural gas. The purpose of this conspiracy is to accelerate the rise in natural gas price levels beyond the schedule set by the Natural Gas Policy Act of 1978. The energy conglomerates have made these decisions with the knowledge that conservation options are being closed off to consumers, and that this abuse is a form of economic piracy. Thank you.

Senator **Jepsen**. Thank you. We will now welcome Constance Berka, United Neighbors of Davenport.

STATEMENT OF CONSTANCE J. BERKA, SPOKESPERSON, UNITED NEIGHBORS, INC., DAVENPORT, IOWA

Ms. **Berka**. Senator, it is indeed an honor to be here today, and we thank you and your office for letting us have the pleasure of speaking before your committee.

I am Constance J. Berka. I live at 618 Myrtle St., Davenport, Iowa. I am a member of United Neighbors, and also a community advocate.

United Neighbors is an inner-city based community organization with 3,400 active household members. Recently United Neighbors formed an ad hoc committee to deal with the utility crisis because the cost of utilities has become the number one survival problem in our neighborhoods. As you are well aware, Senator Jepsen, we do not live in southern comfort, we live in Iowa and it gets cold here in the wintertime. The reason I am speaking here today is because I represent the typical, low income, inner-city utility consumer. Davenport is serviced by Iowa-Illinois Gas & Electric Co., whose supplier is Natural Gas Pipeline Co. of America.

Paying my utility bill is a hardship one month to the next. I am on a fixed income, as are many others in the area. In Davenport for 1982, Iowa-Illinois mailed out 49,764 disconnect notices. Of those, 4,371 households were actually disconnected, which gives you a disconnection rate of 8.78 percent. Besides putting a strain on me, it is definitely putting a burden on the agencies that give direct assistance. The Scott Couty General Relief Office has assisted 155 individual family members with $11,000 already this fiscal year just for utilities. Last year the Scot County General Relief Office spent approximately $33,000 on utility assistance, with the projected expenditure of $44,000 to $48,000 for this current fiscal year. United Neighbors itself has assisted 558 households with utilities in 1982 alone. Iowa East Central T.R.A.I.N., our local energy assistance agency, has received 4,200 calls for assistance this year. Clients call in to give their name, their address and their phone number, and then are placed on a waiting list; 2,800 applicants have been approved thus far this year. The demand for assistance is far greater than the money available, and, therefore, T.R.A.I.N. is expected to run out of money.

It seems that Iowa-Illinois is out to get a profit at any cost. For example, the Louisa plant. Why pay for something that we don't need? We feel that Federal legislation must be pased to stop these increases in natural gas prices. We feel the company is forgetting who is paying th bills and in turn is making a profit for the company. We, the consumers, ask you, what do we get in return? High bills and rate increase. We have rights too. That is why people are organizing and fighting back, because they are fed up with the way the ssytem is run. I want you to know that there are other States fighting with the utility companies, as well as with their commerce commissions. We feel that these rate increases have gone out of proportion.

I recently heard of a case where an elderly person was sitting in her home with the thermostate set at 58 degrees, wrapped in sweaters because she could not afford to pay the utility bill. This is just one example of how hard it is hurting people on fixed incomes. My house has been insulated by T.R.A.I.N., our local energy assistance program. I have storm windows, and I try very hard to conserve energy. In the summer my bill runs $40 to $45. In the winter my bill runs $350. So you can understand why I am upset.

Davenport is being hit by high unemployment. November 1982 figures were 12.6 percent for Davenport and 17.5 percent for the Quad Cities. For the month of December 1982 the unemployment rate for the Quad Cities was 18.8 percent. Due to this high unemployment rate, outrageous utility rates are hurting the Davenport consumer, who is already having a hard time making ends meet.

United Neighbors is against any further rate increases. We would like to see a weathherization program sponsored by the utility company without the cost being passed on to the consumer. In addition, Senator Jepsen, we understand that you want to do something about high natural gas prices. We are requesting that you introduce a bill in the Senate which is similar to the "Freeze Prices, Not People" legislation that Cardiss Collins from Chicago is introducing in the House. This is a comprehensive bill which includes the following points: No. 1, extend controls on natural gas; No. 2, roll prices back to the 1978 level and then work on readjustment of prices: No. 3, eliminate take-or-pay contracts; No. 4, close the back door on FERC; No. 5, eliminate automatic purchase gas adjustments; and No. 6, put all categories of natural gas under control.

We will be monitoring you, Senator, Jepsen, to see that you are actively working on this legislation and that you do vote in favor of cutting natural gas prices. We are glad that politicians such as you in Washington, D.C., and in the Iowa State Legislature are trying to pass utility reform. I say it's been time for a long time. We just don't want to sit there and listen. We want you to do something. There is a saying all over the country, when it comes to utilities you either freeze or you eat. Which do you choose?

Before me I have a ballot used in a national campaign, "Freeze People or Freeze Prices." We are not asking for your signatures now. When you get back to Washington, D.C., we the constituents of Iowa will know by the way you vote, and we sincerely hope we have your support in this campaign. I sincerely thank you.

Senator **Jepsen**. Thank you, Constance.

Now, Opal Morrow may proceed. Ms. Morrow. Opal Morrow, is that correct?

STATEMENT OF OPAL MORROW, MEMBER, UNITED NEIGHBORS, INC., DAVENPORT, IOWA

Ms. **Morrow**. Opal Morrow, Senator Jepsen. I am Opal Morrow, and I live at 1012 Arlington Ave. in Davenport, Iowa. I'm a member of United Neighbors, and also a member of the Machinists Union, Local No. 388. I was a production worker at Bendix for 4 years, but on January 29, 1982, I was laid off. I have been unemployed now for over 1 year and currently I am receiving unemployment benefits. To be quite honest, I don't know what I'm going to do when my benefits are terminated in 6 weeks.

During the 4 years I was employed at Bendix I was earning $8.30 per hour, and the thought of not being able to pay my utility bill never entered my mind. Now, however, due to the increases in natural gas prices and my inability to find employment because of the poor economy, I am unable to pay my utility bill. This year for the first time I had to apply for energy assistance through Iowa East Central T.R.A.I.N. our local energy assistance program. T.R.A.I.N. has approved my application and will be assisting me with $160, however, my accumulated utility bill is $250.

I am one of thousands of laborers in this area who has been hurt by the poor economy. Efficient use of energy is essential for a healthy economy. Local industries such as Case, International Harvester, John Deere, and Caterpillar are huge consumers of energy, and also the most wasteful. These factories are encouraged by the pricing structure to be wasteful because the more they use energy the less they pay per unit.

Increases in natural gas prices do affect all sectors of our local economy, business, industrial, municipal, and residential. Industries pass on production cost increases to the consumer, thereby driving up inflation. People can't afford to buy and inventories go up. When inventories go up, workers get laid off. As utility costs increase, production costs increase for industry. These increases are passed on to the consumer as higher prices. The consumer is forced not only to pay more for their own utilities, but also to pay for industries' increased utility costs. This adds to inflation, large inventories, and, finally, high unemployment. The Quad Cities is a classic example of this. This high cost of energy takes away money that would be paid for wages and benefits. I'm an example of how high energy costs are hurting the American laborer.

Our municipal governments also pass on their increased utility costs to us through fewer services or higher taxes. Higher taxes lessen the consumers' buying power. This, plus fewer city services once again increase high unemployment in our cities.

Senator Jepsen, you must help us in our battle against high utility bills by introducing Federal legislation that would control all categories of natural gas. Second, we ask that you be more creative when looking at the energy problem. For example, the Federal Government could encourage industry to conserve and subsidize industry and small businesses to develop alternative energy sources such as solar and wind. Also, tax breaks for weatherization and funding for mass transit.

A campaign to create jobs through energy conservation and alternative energy sources would be a major boost for the economic condition of low- and moderate-income consumers and working people. Such a program would help slow down inflation and stabilize the economy. According to the former director of the Iowa Energy Policy Council, 85 percent of the money spent on inported energy leaves the State, while only 15 percent of the money stays in the State in the form of wages, and taxes, and so on. On the other hand, of the dollars spent on conservation and other nonenergy expenditures such as retail sales or goods, 60 percent stays in the local economy and is, therefore, more productive. Such a program of conservation and alternative energy sources would create jobs, save energy, help fight inflation, and create a greater economic self-sufficiency.

President Reagan has stated that he wants to strengthen the economy and bring inflation down. As a U.S. Senator supporting our President, your only alternative to realize these goals is to sponsor legislation that would control natural gas prices and short alternative energy source.

Thank you.

Senator **Jepsen**. Thank you.

I'd like to pose a question for either Ms. Blanchard, Mr. Dunn, Ms. Berka, or Ms. Opal Morrow; you can decide among you who would answer it. Two point question. Would you freeze natural gas prices at the 1978 level if you knew that indeed that would result in a shortage of natural gas? With the recommendation in your bill, if it was taken to its complete and full legislative impact, we would have reasonably close to Government control of the gas industry. Is that indeed what you would recommend?

Mr. **Dunn**. Perhaps I can address the question of the shortage situation. We are in the position of having to depend on the gas industry for the estimates of services and those seem to vary according to what sort of prices they are willing to go for.

Senator **Jepsen**. Excuse me, if I may interrupt, and I appreciate what you are saying, but my question is this, would you support a price freeze at the 1978 level if you knew that a severe shortage would result?

Mr. DUNN. If it's that tightly linked, we couldn't because—if you are saying that that would automatically bring about a shortage—we would be facing that sort of shortage situation, but I think you can also look to the remarks that several of the speakers have just made which point to the ability of industry to switch to other fuels and the efforts of consumers to conserve.

Senator JEPSEN. Do you want to answer the second part?

Mr. DUNN. State it again, please.

Senator JEPSEN. Should the gas industry be taken over by the Government?

Mr. DUNN. Well, it's a situation for the most part of monopoly. I don't know of any legal situation where several companies are drilling to try and tap the same pool of gas that may exist. In situations where you have monopolies you have to have regulation. You don't have normal market forces going on, and who regulates in that case is the Government. Now, you are saying that that legislation we advocate would mean a total takeover of the gas industry.

Senator JEPSEN. It approaches it.

Mr. DUNN. Yes. If that's what it takes in order to bring a fair situation into the supply of the pricing structure.

Senator JEPSEN. There are about 26 pipeline companies. How many should there be? What would you say the number should be to avoid having a monopoly?

Mr. DUNN. I'm not saying necessarily that you can't avoid having a monopoly. I'm saying that you have to regulate the monopolies that exist.

Senator JEPSEN. Do you consider that 26 companies is a monopoly? I'm just getting this for the record.

Mr. DUNN. I would say so.

Senator JEPSEN. Any others care to comment on that? If the Government took it over—let's pursue this a little bit further. If the Government took it over, then we would have one Government pipeline. Would that be a monopoly when they own it all?

Mr. DUNN. Well, now, you are saying that we're advocating that the Government take over the entire industry, is that what you are saying? You seem to believe we're saying—we're just meaning——

Senator JEPSEN. I'm really basically asking would that be all right or would that be wrong?

Mr. DUNN. Let me try to understand what we're getting at.

Senator JEPSEN. Well, why shouldn't the Government take over the pipeline industry?

Mr. DUNN. Well, it would be a pretty difficult process right now. We're asking for fairness in the regulation; we're not asking necessarily for the Government to take over the company, to buy them out. Is that what you think we're asking?

Senator JEPSEN. I don't know how it might be done, and I don't want to be belaboring it or debating it; I'm just trying to clarify the thoughts of the extent of the specific legislation that you had recommended in the five or six——

Ms. BLANCHARD. I don't believe that we're asking for a Government takeover of the natural gas companies. But right now, the pricing isn't equitable, and the low- and moderate-income people are suffering at the expense of large company profits. Now, Northern Natural Gas Pipeline is entirely owned by InterNorth. There is such and—and at the same time InterNorth owns—wait a minute. In 1981, InterNorth's annual report said investments in Mobil Oil common stock, $61,884,000. The regular consumer does not have a chance. We're at the mercy of one pipeline that supplies us. We're at the mercy of one utility who distributes it, and we're at the mercy of one producer that the pipeline and the distributor purchase from. Now, we just want an even break, and right now we haven't been receiving it when our rates have been doubling in the last 4 years. Our rates have doubled. At the same time, people are making large profits. We are not asking for national legislation. We're asking for solutions to the problem, and we're giving solutions that we think will be helping. Now, to make blanket statements as to say we want to nationalize, you are missing the entire point. We want to help you solve a problem that is affecting the American people today. We're not asking for the Government's takeover.

Senator JEPSEN. I understand, and Linda, I would remind you I was asking that question, if you thought that was wrong.

Ms. BLANCHARD. I'm sorry, Senator, but those types of statements, it's like us and them, and that's not what America was built on is us, management and labor, the rich and the poor, it's everyone working together, and when you start thinking of blanket statements you are not going to reach the solutions that are going to benefit all. Now, the suppliers, the producers, the distributors, they have given their testimony so that they can aid you in making a decision, and we would like to do the same thing, and we think that this will be the proper solution to those, and we want you to think about them because there are more people in this country besides those people, the distributors, the producers; there is the consumer who has to pay it.

Senator JEPSEN. That's why you were represented here today, and I thank you for your statements.

Ms. BLANCHARD. Thank you.

Senator JEPSEN. And I know and am pleased to see the unity of all of us, and we say it takes all people in this country to make America work, and we've got to work together to make it work. We indicated that early on.

Ms. BLANCHARD. We also had 40,000 signatures on petitions that we presented at the FERC hearing that people have signed, that Iowans have signed, saying that they need help. They need some legislation. They need something done about these high natural gas prices, and so we are not standing alone, and I'm sure those other 40,000 people are not asking for blanket legislation such as taking over the national prices either, or the industry.

Senator JEPSEN. Is there anyone that has any additional comments they would like to make? Yes, Christine Hansen.

Ms. HANSEN. Senator, you did mention when you opened this hearing that you didn't have a specific representative from industry, and we don't leave the committee with an erroneous impression about what industry is doing in this State and how important they are to the natural gas distribution companies in this State.

Ms. Morrow said that she felt industry was extremely wasteful, and the facts are to the contrary in Iowa. John Deere, for instance, which is our largest manufacturer in the State, has cut their total cost of production in energy use by 40 percent. The cost of John Deere tractors, I understand, is still pretty high, but that's not because they haven't conserved to the very highest degree.

We have four companies in the State with total industrial sales representing more than 70 percent of their total load; we have two gas companies in the State with industrial sales representing more than 80 percent of their total load, and we have one large gas distribution company, Iowa Public Service, that serves Sioux City and Waterloo, that has 20 percent of their load serve one company. Terra Chemicals, which manufactures farm chemicals, that company has some financial problems in marketing its product at the price it can charge, and there is a potential there for one distribution utility to lose 20 percent of its load with one company closing down. It would have a substantial impact on the rest of consumers too. I do want you to know that industry is very important to the natural gas load in this State.

Senator JEPSEN. Dean Kleckner, please.

Mr. KLECKNER. Senator, farmers are massive users of energy too. And I don't know anybody that's happy with the cost of whatever energy source they are using today, whether it's natural gas, LP gas, diesel fuel, anyway, it's too high. We start out knowing that. I happen to also believe that it was too low for a number of years. I just loved buying my LP for 8 cents a gallon. I don't know what that converts to, but it's gone up 12 times from the 1970's. I loved buying gasoline for my car at 25 cents for a gallon. Four for a buck. I remember those days. Frankly, those prices were too low. The Government was regulating back then and they shouldn't have been. The market should be establishing the price. It would have been lower today had the market established the prices in those areas of all those energy commodities. We would have now developed the alternatives. Solar, wind, we'd have those today.

I say to you the 1978 Natural Gas Policy Act was a mistake. It may have seemed like it was working for a year or two. It didn't work. Don't for heaven's sake put on more band aids by the Natural Gas Policy Act of 1983, if that's what you end up with. It will be a mistake too. The Government doesn't do things very well; the market does. We'll have lower priced natural gas for all these consumers, for all these farmers, for all industries if the market takes over because it's now at that market price. The time to deregulate is when you have an excess, and that's now. Probably the time not to regulate if you first make the mistake of regulating is when you have a shortage. There is no shortage today. Let's get out of business. The market is going to give us the best price.

Senator JEPSEN. Anyone else have a closing comment?

Mr. DANIEL. I would just like to add on what Commissioner Hansen has said with regard to the industrial load. Our feeling is, as I mentioned in my oral statement, we have one customer who represents a very substantial portion of our total sales, industrial sales. If we lose that customer it will hurt us greatly. Not only do industrial customers switch, but you also have the hazard of the customer going out of business, and this is particularly true in the case of the fertilizer installations. And that makes jobs for the areas that we serve.

Senator **Jepsen**. Is there anyone else that would like to make a closing statement for the record?

Ms. **Berka**. Senator, I just feel from listening to Mr. Daniel from the Iowa utility company, if he would care as much about the consumer, me, the low paying one, as he does about his bigger companies, I have just as much right as the bigger companies do, and I feel I'm just quite upset about it.

Senator **Jepsen**. All right. Any other comments, Mr. Dunn?

Mr. **Dunn**. No. Thank you.

Senator **Jepsen**. Linda Blanchard?

Ms. **Blanchard**. No.

Ms. **Berka**. We put just as much profit in his company as the bigger industries do in this area.

Senator **Jepsen**. I appreciate the comments, and I thank you all for participating, Christine Hansen, Dean Kleckner, John Daniel, Linda Blanchard, Gordon Dunn, Constance Berka, and Opal Morrow. Everyone recognizes also that we do need to provide a solution to the natural gas pricing problem of today. I think that is one thing that everybody on both panels agree on, that we do have a problem of the pricing and we need to find a solution.

Iowans have seen their natural gas prices increase nearly a hundred percent in the last 3 years. They have a right to expect that their conservation efforts and the natural forces in the marketplace work properly and fairly in their behalf. Clearly it is not the situation now, and at the same time we have found today that when we have representatives from the producers, from the pipelines, the transmitters, the utility companies, and so on, they too are concerned about the problem. Although they do not totally agree about the solution, they have given us some of their views with regard to providing natural gas or heat. When you turn on your switch or your stove, whether it be 30 below or 30 above, you want to be able to depend on it. And that takes some long-range planning in both the distribution and the amount of reserves that one must have. This is everybody's problem, and everybody in this country has got both a right and a need to have input, and if we lock arms and we all work together we will solve it.

I do thank you very much. I want to express my appreciation for the conduct and the thought that has gone into all the testimony here today. We will see that the compiled reports here and the consensus that has been brought up and summarized from them will be presented to the Joint Economic Committee and to the various subcommmittees in the Congress that deal with this problem, as well as the Iowa Commerce Commission, and will be presented to each and every one of the participants here today. I thank you all for coming, and have a safe trip home.

The hearing is adjourned.

[Whereupon, at 12:31 p.m., the hearing was adjourned, subject to the call of the Chair.]

[The following information was subsequently supplied for the record:]

STATEMENT OF THE PROCESS GAS CONSUMERS GROUP

The Process Gas Consumers Group (PGC) is an organization of industrial consumers of natural gas organized to promote the development and adoption of coordinated, rational, and consistent federal and state policies with respect to gas use. Representing many of the Nation's basic industries, our member companies own and operate hundreds of plants in virtually every state and purchase natural gas directly or indirectly from both interstate and intrastate pipelines, with most of our facilities on the interstate system.

I. STATEMENT OF POSITION

While the range of uses in which PGC members use natural gas is quite broad, PGC's views with respect to natural gas issues reflect primarily its members' use of natural gas in industrial processes in which alternate, non-gaseous fuels cannot reasonably be utilized. From this perspective, there are two paramount natural gas issues: (1) security of supply and (2) price. The first issue involves primarily the matter of reliability -- consumers' ability reasonably to depend upon their suppliers to satisfy their gas requirements. The second issue encompasses not only price levels vis-a-vis alternate fuels, but also the effects of pricing policies and rate design on the relative rates paid by various classes of gas consumers.

PGC's concern with supply security may seem to some to be unwarranted, particularly during this period when (1) interstate pipelines appear to be madly scrambling to find ways to dispose of their excess gas supplies, and (2) we are repeatedly told that the United States' conventional gas resource base remains sufficient to meet current levels of demand for several decades. However, neither current supply surpluses nor these gas resource forecasts give industrial users any significant comfort.

The promising supply forecasts by and large assume the existence of a free market at the wellhead and, thus, prices for gas which in fact approximate its "market-clearing" price. Today, however, the partially-regulated "market" under the NGPA is characterized by wildly disparate prices -- some far below "market clearing" and others absurdly above it. Some pipelines are already experiencing real industrial load losses as they purchase expensive supplies under strict take-or-pay provisions and turn away cheaper supplies. High-cost supplies are being produced before lower-cost supplies, further depressing demand and distorting the signals sent back to producers as to future gas needs. Thus, so long as substantial volumes of natural gas remain subject to distorting price controls -- which insulate gas prices from the realities of the market and inexorably push some prices higher while others remain artificially low -- industrial users are not comforted by large estimates of conventional domestic gas resources which are producible at reasonably stable, free market prices. PGC is confident that the free market -- not "quick fix" tinkerings with the current scheme -- will work to produce those resources and bring supply and demand into balance. But, until such a free market exists, PGC has no such confidence in long-term gas supply reliability.

The same observations may be made with respect to the gas surpluses currently being experienced in some parts of the country. PGC believes that such surpluses are in part the product of the unstable conditions which have been fostered by the Natural Gas Policy Act of 1978 (NGPA). The perpetuation of such conditions is no basis upon which to make energy policy, and such conditions are inimical to restoring industrial user confidence in the gas market's ability stably to meet their long-term needs.

PGC's concern with supply security, of course, does not reflect industrial users' willingness to pay any price for such reliability. However, while we are no more anxious than anyone else to see our gas bills increase, we are ready and willing to pay true free-market prices for gas because we anticipate that such prices will be more stable -- and lower in the long run -- than would be the case under the NGPA. We also believe that such free-market prices will be lower than the costs that we (and the Nation) will incur if energy policy regresses to the reimposition of price controls with the attendant risks of renewed supply shortages and resultant economic and social dislocations.

Thus, PGC believes that wellhead price controls must be removed if supply and demand in the gas market are ever to be brought into balance. However, we must emphasize that, while we are willing to pay free-market prices for gas, we are strongly opposed to (1) paying prices higher than those which would be commanded in a truly free market, and (2) paying a disproportionate share of higher gas costs so that other gas consumers can be subsidized, such as through so-called incremental or marginal cost-based pricing schemes.

As consumers, we are concerned about the impact of higher gas prices on our businesses, our customers, and our employees. But it is precisely that concern which leads PGC to support comprehensive legislation to deal with the serious defects in the NGPA and the resulting harmful distortions in natural gas markets. PGC does not believe that its goal of obtaining adequate gas supplies at reasonable prices will be achieved under the NGPA in its current form. But, even more important for purposes of today's hearing, we do not believe that the kinds of partial, stop-gap "solutions" which many are currently proposing are solutions at all. The temptation to attempt to deal only with portions of the natural gas problem is indeed strong, but the risks are high that the problem will only be exacerbated if Congress yields to that temptation.

In our view, half a loaf in these circumstances is worse than none.

For the reasons discussed below, therefore, PGC respectfully urges that the Congress decline to adopt the kind of myopic, "quick fix" proposals which have recently been advanced and, instead, turn its attention to consideration of natural gas legislation which will deal boldly and comprehensively with the problems now facing the gas industry and gas consumers. Now is the time to take steps to get us out of the mess created by the NGPA. Congress must resist the temptation to adopt superficial measures which will only sink us deeper into that mess.

Set forth below are PGC's comments on certain of the gas legislation proposals which have recently been introduced. Following those comments, PGC sets forth in broad outline the elements of comprehensive gas legislation which it believes should be endorsed by this Committee and enacted expeditiously.

II. COMMENTS ON PENDING LEGISLATIVE PROPOSALS

PGC approaches the current natural gas crisis as industrial gas consumers who pay the bills. We also approach the situation as manufacturers who need assurances that natural gas -- as well as all other forms of energy -- will be available for us to purchase in the quantities we need and at prices we are willing to pay. Without that kind of long term energy market stability, we cannot rationally plan the investments we need to make to get this country's economy solidly back on its feet for good. Unfortunately, price regulation at the wellhead is anathema to stable prices and supplies. The Natural Gas Act produced shortages, and the NGPA is producing the current mess.

Consequently, PGC opposes adoption of myopic bills which would simply tinker with the NGPA's misguided scheme of price controls in the hopes of extending their operation. Now is the time to stop trying to run the marketplace from Washington and to call an end to all wellhead price regulation once and for all. Price regulation didn't work for oil; it didn't work for the economy as a whole; and it isn't working for natural gas.

With respect to the many bandaid bills which have been introduced, each is seriously flawed. Each will produce serious adverse consequences in both the short and long term, and each will have your constituents back at your door in relatively short order.

The provisions of the various bills that are currently pending or were introduced in the last Congress may be grouped for convenience in three general categories: (1) comprehensive NGPA reform; (2) wellhead price freeze and extension of controls; and (3) relief from pipeline/producer contract terms. PGC believes that the impact of the latter two types of proposals (either alone or in combination) on the gas markets would be significantly adverse and that they should be rejected in favor of legislation which deals with the NGPA in a more comprehensive and long-term fashion.

A. The first category of bills (i.e., comprehensive NGPA reform) includes S. 2074, introduced in February 1982 by Senator Johnston. With the exception of certain problems discussed below, PGC believes that S. 2074 represented a reasonable and workable compromise for eliminating the serious price, supply, and financial problems arising under the NGPA. Although there are provisions of this bill which we would prefer be modified, we believe that it is the only one of the various proposals introduced so far which has the potential to restore stability to the gas market. The bill's provision for phased, but full, decontrol of wellhead prices promises that such prices will be more stable -- and likely lower -- than would be the case under the NGPA. By moving toward free-market wellhead prices -- rather than away from them, as is proposed by the other bills -- S. 2074 avoids the other proposals' substantial risks of renewed gas supply shortages and resultant costly economic and social dislocations.

The Johnston bill's repeal of the Fuel Use Act, Title II of the NGPA ("incremental pricing"), and Title III of the Public Utility Regulatory Policies Act are all critical elements of gas reform legislation. These artificial demand restraints on selected sectors of the gas market have proven to be utter failures in holding down the rates of favored consumers; they have created an enormously complex regulatory morass; and they will become even less important as we move toward a freer market at the wellhead.

PGC does believe, however, that Sections 304 and 305 of S. 2074 were ill-conceived. These provisions would, in virtually all circumstances, guarantee that pipelines and distribution companies will be able to recover whatever gas costs they may incur, even if such costs are incurred as the result of abusive gas purchasing practices. These guaranteed cost passthrough provisions would be seriously damaging to consumers' ability to exert meaningful influence on the purchasing behavior of their gas suppliers. They would distort both supply and price since producers would be effectively insulated from knowing how much consumers actually value natural gas.

The rationality of a truly free market can never be established at the wellhead if consumers are rendered helpless to challenge the gas purchasing behavior of suppliers who abuse their natural monopoly status and their general ability to pass through the costs which they incur. PGC believes, therefore, that the grounds (set forth in NGPA Section 601(c)(2)) upon which pipeline gas purchase costs may be denied pass-through treatment should be expanded, not restricted in the manner proposed by S. 2074. Nevertheless, as discussed below, PGC does not believe that simply broadening NGPA Section 601(c)

(2) alone would constitute a sufficient legislative response to the current chaos in the gas market.

As stated in its further detail below, PGC believes that complete deregulation of wellhead prices must be accompanied by a market-oriented resolution of the so-called "contract problem." */ While pleased that Senator Johnston included in S. 2074 a proposal for dealing with the contract problem, PGC believes that a more straight-forward approach might be more effective, such as an approach which (as discussed elsewhere in this testimony) would encourage producers and purchasers voluntarily to renegotiate their existing contracts and which would facilitate such renegotiation. Although the contract conversion approach contained in S. 2074 is appealing because it would operate in a manner similar to the seller-buyer dynamics in a free market, that approach is extremely complex and therefore, as a practical matter, could create problems of its own. Moreover, its complexity aside, even if the bill's contract conversion approach were revised specifically to prevent the operation of above-market fixed price escalators (in addition to indefinite price escalators), there is little assurance that the provision could be framed to give gas purchasers effective protection against all kinds of problem con-

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*/ Although H.R. 131, introduced by Congressman Gramm, contains many key provisions necessary for comprehensive legislation, it is defective insofar as it fails to deal with the contract problem at all.

tract clauses drafted to fall outside the bill's definition of "commodity escalator clause" (Section 404(b)), and such clauses could escalate prices above market clearing levels and lead to the kind of market disruptions the bill is intended to avoid.

Notwithstanding, however, these specific criticisms of certain provisions of the bill, PGC does believe that, if revised consistent with the foregoing, S. 2074 represents a generally sound compromise of the issues which have arisen under the NGPA. Enactment of such legislation would give rise to more stable and likely lower gas prices for all consumers; would allow gas supply and demand to come into balance (insuring adequate long-term gas supplies after the current short-term surplus ends); permit less volatile and more secure market revenues for pipelines and distribution companies; permit gas producers the cash flow they need to finance gas exploration and development activities; and eliminate the incentives which gas producers now have to produce high-cost gas resources before lower-cost resources.

B. The second general category of bills provides for a temporary or permanent freeze on wellhead prices. For example, S. 60 (introduced by Senator Kassebaum) and H.R. 583 (introduced by Congressman Glickman) both provide generally for a two-year price freeze and two-year delay of the NGPA's scheduled deregulation of certain gas categories; H.R. 619, introduced by Congressman Kastenmeier, calls for a permanent freeze and permanent continuation of price controls.

A freeze on wellhead prices would, at best, simply halt the inexorable price increases being experienced under the NGPA; it would not allow gas consumers to see any reduction in their gas bills. Moreover, any price relief which is experienced may likely be short-lived. This is due to the fact that freezing price ceilings at mid- to late-1982 levels would be an invitation, if not an order, for renewed gas shortages. It would severely undermine exploration and development for new reserves and, at the same time, send a signal to users to increase consumption. With the elimination of incentives and the gradual erosion of price ceilings by inflation, these freeze provisions would send a message to producers that Congress cannot be trusted to fulfill its commitment to deregulation and that permanent regulation might occur. As shortages develop, there would be greater demand not only for imported oil, but also for imported gas at unfrozen prices. Thus, any potential cost savings resulting from the freezing of domestic gas prices would be reaped by foreign producers, not by gas consumers -- just as was the case in the pre-NGPA era.

In addition, the rigidity of these price freeze proposals would deprive the gas market of all flexibility to meet changed circumstances until a new crisis forced Congress back into the picture -- creating the potential for a replay of 1978's sorry experience with gas legislation.

By returning to a fully price-controlled environment, the financial situation of all sectors of the gas industry would suffer as market volatility makes it substantially more difficult to plan exploration, purchasing, and marketing activities.

Today's gas market problems are due in large part to the fact that, in 1978, Congress did not go far enough, not because it went too far. The solution, therefore, to today's problems do not lie in regressing to the pre-NGPA price-controlled approach, but rather in fixing the flaws in the NGPA in order to permit the transition to a fully decontrolled market to be effected more smoothly and effectively.

C. The third general category of the legislative proposals includes those which reflect the belief that a Draconian solution to the "contract problem" is all that is needed to "fix" the NGPA. This category includes S. 239 (introduced by Senator Jepsen) and several others introduced in the 97th Congress (e.g., S. 3028 (introduced by Senator Metzenbaum), S. 3070 (introduced by Senators Danforth and Eagleton), S. 3076 (introduced by Senator Specter), and S. 3088 (introduced by Senator Chafee). These proposals range from outright blanket prohibitions against all take-or-pay clauses and indefinite price escalators to a broad expansion of the grounds upon which the FERC may block the passthrough of pipeline purchase costs and act to revise or annul contract terms. (Some of these bills also provide certain reporting requirements under which pipelines report to FERC their progress in achieving the lowest possible weighted average gas acquisition cost.) _*/_

Although PGC agrees that piplines' take-or-pay obligations are unreasonably high in many contracts negotiated under the NGPA, we also recognize that take-or-pay clauses provide producers (particularly independents) with some income stability and the cash flow needed to finance new exploration and development. A blanket prohibition against take-or-pay clauses would, therefore, cause an immediate reduction in exploration and development and then eventual shortages. Moreover, such a prohibition would be yet another boon for foreign gas producers who would be exempt under it (_see_, _e.g._, S. 3076).

An outright ban on all take-or-pay clauses would also result in rising gas prices as producers lose cash flow stability and markets begin to tighten up. In exchange for their

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_*/_ S. 60 combines its proposed "contract problem" solutions with a proposed price freeze. This combination of proposals makes it even less desirable than bills which propose simply one or the other. S. 60 would devastate gas exploration and development and inevitably lead to supply curtailments to gas consumers. Faced with frozen prices, plus a loss of take-or-pay commitments (and the appearance that Congress will keep extending controls), domestic producers would slash their exploration and development budgets. Significant gas curtailments could begin quickly in some areas of the country and adversely affect meaningful economic recovery. Again, Canadian, Mexican, and Algerian producers would be in the best position to take advantage of such shortages by raising their prices while U.S. producers are prohibited from raising theirs and eliciting greater domestic supplies.

added risks, producers would demand higher sales prices to justify their investment in exploration and development, and the tighter markets would enforce those demands for higher prices. (If a freeze proposal were also enacted, the higher prices would not be avoided; they would simply be collected by foreign gas sellers.) As a result, gas consumers would be dealt a double blow: forced to pay both the higher charges commanded by foreign or domestic producers plus a larger share of the pipelines' and distributors' fixed costs as their markets shrink.

Further, apart from the enormous administrative burden which would result from the proposed exemption provisions (see S. 3070 and S. 3076), pipelines which are totally freed from take-or-pay obligations would be placed in a strong position to favor their own gas production affiliates at the expense of potentially lower-priced gas from independent producers.

Finally, although PGC certainly supports measures to encourage pipelines to purchase first the cheapest gas available, the rigid "cheapest-first" rule being proposed (see 3076, S. 3070) would be extremely complicated and expensive to implement. It would require many pipelines to adopt complex new operating procedures and to install expensive metering equipment -- all of which would be paid for through higher rates to consumers. Moreover, it would inevitably lead to extensive litigation which, apart from the costs which it too would impose on ratepayers, would create the kind of uncertainty which seriously undercuts the ability of the gas market to develop and deliver secure long-term supplies.

With respect to proposals to expand the terms of NGPA §601(c)(2), PGC believes that the intent of such provisions in S. 239 (and in last session's S. 3028, and S. 3054) is certainly laudable. Customer resistance to high gas prices is an essential element in bringing gas supply and demand into balance and keeping them there. Since interstate pipelines and local gas utilities are still subject to regulation (and will remain so even after full wellhead price decontrol), the ability of gas consumers to challenge excessive gas acquisition costs in regulatory forums is essential if pipeline purchasing practices are to be restrained, especially during the transition to full decontrol.

Thus, it is entirely appropriate that Congress include in gas reform legislation provisions to safeguard consumer's interests in this manner -- and reject the FERC's very narrow reading of Section 601(c)(2) which virtually wrote "abuse or similar grounds" out of the statute. Senator Jepsen's proposal in S. 239 -- which would include a rebuttable presumption of "abuse" -- seems to be the most reasonable approach, allowing pipelines both (1) to know in advance which specific actions will render them potentially vulnerable under Section 601(c)(2), and (2) to rebut a charge of "abuse" by showing that an agreement to the disfavored contract terms is justified under the circumstances or is otherwise offset by other more favorable contract terms. */

It must be emphasized, however, that while PGC believes that the approach taken in S. 239 is a good one, we also believe that adoption of such a measure alone will not be a sufficient legislative response to the problems of the gas market. In contrast, if the Jepsen bill were substituted for existing Sections 304 and 305 of S. 2074 (the Johnston bill last session), the result would be the kind of comprehensive legislation which would improve the long-term health and stability of the natural gas industry and its customers.

III. PGC PROPOSAL FOR NATURAL GAS LEGISLATION

In their "Dear Colleague" letter of December 8, 1982, Senators Eagleton and Danforth cited the economically illogical fact that "a substantial surplus of gas on the market" is currently accompanied by significant gas price increases and the shutting in of large volumes of lower-cost supplies. They observed: "At the time of passage of the Natural Gas Policy Act, no one anticipated this kind of breakdown in the operation of the free market."

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*/ In contrast, the approaches suggested in S. 3028 and S. 3054 appear to be too open-ended and, therefore, too uncertain to afford either meaningful protection to consumers or meaningful guidelines for pipelines.

While PGC certainly agrees that it was not anticipated in 1978 that such inconsistent economic events could occur simultaneously, PGC vigorously disagrees with the premise that these events have resulted from a breakdown in the operation of the free market. The NGPA did not create a free gas market, and the Nation's sad experience under the NGPA teaches us nothing about how free markets operate. At best, the NGPA has taught us that a part-regulated/part-deregulated "market" severely distorts the exploration and development, distribution, and price of natural gas; causes rapidly rising wholesale and retail prices without inducing corresponding increases in gas supplies; produces surpluses in some locations and shortages in others; and contributes to the demand for energy imports, such as exorbitantly priced LNG from Algeria.

In short, the free market has not broken down; the mess in which we currently find ourselves is simply the result of gas producers, pipelines, distributors, and consumers all attempting to pursue their legitimate self-interests and fulfill their obligations in a hopelessly-confused pseudo-market. While perhaps no one could have predicted in 1978 that things would go as far awry as they have, Congress' failure to deregulate natural gas at that time could reasonably have been expected to deprive the gas market of the flexibility needed to respond to dynamic and unforeseen changes in the economy, oil prices, and other factors bearing on gas supply and demand.

PGC believes that it is time to give the market a chance to work. Therefore, in order to increase the stability of the gas industry, enhance service to gas users, hold down prices for all consumers, avoid future supply shortages, and eliminate the market distortions caused by the NGPA, PGC advocates the adoption of comprehensive gas legislation containing the following key provisions:

(1) Remove wellhead price controls from all natural gas as of January 1, 1985. For the reasons discussed in greater detail in Section IV of this testimony, PGC believes that deregulation of all gas, in contrast with NGPA-type deregulation of only some gas or the reimposition of price controls, is the prime element of a package that would produce the fairest and most economically efficient solution to the problems confronting the Nation's gas markets. Any effort to retain controls on some or all categories of supplies will inevitably yield market distortions analogous to those experienced under the Natural Gas Act and the NGPA.

(2) Complete deregulation of wellhead prices must be accompanied by a market-oriented resolution of the much-discussed "contract problem." PGC recognizes that extreme contract terms which were induced by the NGPA's scheme of partial regulation will have to be modified if the transition to deregulation is to be effectuated smoothly and successfully. While many suggestions have recently been aired as to how the

contract problem should be resolved, PGC favors the type of approach which would encourage producers and purchasers voluntarily to renegotiate their existing contracts and which would facilitate such renegotiation. PGC believes that such an approach is preferable to others which have been suggested both (1) because it best simulates the operation of a free market immediately even though the transition to a fully free market is still in progress, and (2) because, in contrast with complicated caps and contract clause conversion options, this approach is straightforward, easy to understand and, therefore, easier to implement without extensive regulatory (and judicial) oversight.

Renegotiation by the parties will produce better results than will Congressional efforts to structure gas purchase and sales arrangements by fiat from Washington, D.C. In view of the substantial surplus of deliverable supplies that now exists, consumers should be the principal beneficiaries of renegotiation at this time, while both producers and consumers will benefit from wellhead price deregulation over the longer term.

As envisioned by PGC, a renegotiation clause would be inserted in all contracts in existence on day of enactment which cover sales by a producer to a buyer for resale to third parties; the renegotiation clause would enable either party to request reopening of the contract for renegotiation. If a resolution satisfactory to both parties is not achieved within a specified period (e.g., 90 days from the request for reopening) then either could opt out of the contract and seek other buyers or sellers of gas.

To provide supply stability to pipelines, it would be reasonable to give pipelines a right of first refusal in cases in which a producer opts out in favor of another buyer. However, to protect independent producers from potential bad faith bargaining tactics, pipelines would not be given a right of first refusal in cases in which the pipelines was the one to opt out of a contract. Similarly, to protect independent producers from abuses of pipelines' monopsony power, pipelines would have to be obligated to provide transportation services at "just and reasonable" rates approved by the FERC in the event a producer sold gas to a third party.

This type of solution would be similar to the "market out" clause mechanism which some pipelines and producers have included in their contracts for deregulated gas in recent years. Those clauses recognize that, while parties desire long term contracts, they must be free to adopt price and non-price terms to meet changing market conditions over time.

By inserting these clauses in all contracts existing at the time of enactment, all parties to wellhead gas sales contracts would be able to insist on renegotiating their contracts. Consequently, any party with an unfavorable contract relative to prevailing market conditions would be able to bring its contract in line with the current market. Self-interest should assure that this is done and should prevent any party from overreaching during the difficult transition to full decontrol. Thus, it would be unlikely that Congress would have to get back into the picture. However, to assure a continuing vehicle for contract adjustment, the legislation would provide that the renegotiation clauses would remain in all contracts (including new ones) for at least one year after the completion of phased decontrol. At that point, the market should be well balanced, and buyers and sellers will likely voluntarily include market out clauses as a routine matter.

Monitoring should be done by FERC. FERC would be authorized to collect data on contract renegotiations and would require public filing of existing and new contracts. There should be a clarification of FERC's power to protect consumers from prices which result from abuses of a pipeline's management discretion or its duties to its customers. The purposes of this action would not be to permit "backdoor" producer regulation, but solely to protect consumers from an aberrant pipeline's efforts to use its monopoly position to pass through excessive costs resulting from serious errors of management judgment. Customers of regulated pipelines should not have to absorb higher gas costs than the pipelines could charge if they resold gas in a competitive market.

(3) Repeal the incremental pricing program (NGPA Title II) and the Powerplant and Industrial Fuel Use Act. Repeal of these measures should be accomplished in such a way that their effects cease immediately.

(4) Provide for the mandatory filing with the FERC of all natural gas purchase contracts between producers and pipelines and make them available for public inspection.

(5) Provide expanded access to natural gas supplies by all pipelines, distribution companies, and end-users.

Finally, any gas reform legislation should not include any so-called "windfall profits tax" on natural gas. The concept of taxing away so-called "windfall" profits is fundamentally repugnant to PGC members. Regardless of when and how natural gas is decontrolled, natural gas producers should be permitted to charge and retain the full free-market price of such gas.

IV. FURTHER COMMENTS ON THE NEED FOR FULL DECONTROL

A. Experience With Partial Wellhead Price Controls

The relative desirability of total wellhead price deregulation is most obviously demonstrated by the miserable experiences this Nation has had with partial regulation of wellhead prices. Under the Natural Gas Act, wellhead purchases by interstate pipelines were regulated, while purchases by intrastate pipelines were not. Nearly a decade of interstate gas shortages resulted, while the intrastate market demonstrated that the free market works.

In contrast, while it extended regulation to the intrastate market, the Natural Gas Policy Act simultaneously deregulated wellhead prices for natural gas in certain categories, and it will deregulate other major categories of gas in 1985 and 1987. This partial deregulation structure has had the unfortunate results of (1) triggering exorbitant (cushion supported) prices for narrow categories of Section 107 gas and (2) creating a potentially explosive set of contract terms for gas to be deregulated in 1985. Already, contracts for deregulated gas have created serious and growing market losses for some pipelines. In 1985, when several times as much gas will be deregulated, the results could be highly destructive.

This so-called "contract problem" results from widespread gas purchase contracts containing both (1) indefinite pricing clauses which link deregulated natural gas prices to the highest gas prices being paid in a defined area or to the price of other fuels, such as No. 2 fuel oil, and (2) take-or-pay clauses which require pipelines to pay for 85%-90% of tendered supplies even if there is no resale market. (Extreme "definite" pricing clauses, which begin from a high floor and escalate according to inflation or to fixed percentages, are also serious problems in some contracts).

These problems would be resolved if we moved to a totally deregulated environment at the wellhead, while taking steps to undo the contract distortions created by four years of partial regulation under the Natural Gas Policy Act and by many pipelines' imprudent gas contracting practices. Moreover, in a deregulated environment, supply and demand would be kept in balance and the severe problems of the past would not recur.

B. Uneven Distribution of the Cushion

Deregulation of all gas, as opposed to NGPA-type deregulation of only some gas, will put all pipeline purchasers of natural gas on a relatively equal footing, with all having to compete with other energy sources available to consumers. Most obviously, elimination of the so-called "old gas cushion" will largely eliminate a major government-created advantage which is very unevenly distributed among gas companies.

A partial deregulation structure implies that those pipelines with the largest blocks of cheap regulated gas will have lower average resale rates and a greater ability to purchase new natural gas (*i.e.*, an ability to pay relatively higher prices without seeing average retail rates exceed alternate fuel prices). In this way, partial deregulation imparts significant economic advantages to gas companies and consumers in some areas of the country and disadvantages to others for no reason other than government fiat and historic accident.

PGC does not accept the theory that the "cushion" is no longer meaningful because high priced gas contracts have totally offset it. First, although no one has accurately assessed all pipelines' cushions, it appears that not all pipelines have used up their cushions. Thus, some pipelines will have significant advantages in future years. Second, the observation that some pipelines have already offset their old gas cushions with expensive deregulated gas does not mean that the cushion can be forgotten. If either (a) as is expected, lower deregulated gas prices result from a resolution to the contract problem, or (b) notwithstanding the current potential downward trend, petroleum prices were to increase significantly, the importance of the old gas cushion could quickly be reestablished to the advantage of some pipelines over others. That, in turn, would lay the foundation for a new cycle of excessive bidding on new supplies -- *i.e.*, for a new contract problem -- parallel to the one from which we are now trying to extricate ourselves.

PGC submits that the Nation and the gas industry as a whole would be better served if these artificial differences are removed as soon as possible.

C. Equivalent or Cheaper Retail Prices

Deregulating the price of all natural gas will not raise the *average* retail gas price any higher than will partial deregulation of new gas only. Competition with alternate fuels at the retail level will establish the upper limit for retail prices regardless of whether wellhead prices are deregulated in whole or in part. That is, the *average* wellhead price will settle at whatever level is needed to sell the total volume of deliverable natural gas supplies at the retail level.

Consequently, the primary effect of restricting some gas wellhead prices at below the average market level is simply to produce above-average prices for the remaining, deregulated volumes of gas. In other words, in a setting of partial price controls, producers of deregulated gas and foreign gas exporters will get the principal economic advantage of the regulated cushion, not users. The exorbitant price of Section 107 gas under the NGPA amply demonstrates this fact. Large sums of capital have been diverted to drilling deregulated gas deeper than 15,000 feet rather than cheaper sources in shallower reservoirs, solely in order to capture the special economic benefits afforded by the NGPA's cushion of regulated gas.

In fact, the NGPA's complex mix of partial price regulation and phased deregulation is producing higher overall prices than would prevail in a totally free wellhead market. Deregulation of all supplies accompanied by a solution to the NGPA-created contract problem would produce lower retail gas prices than under the NGPA, in both the short and long-terms.

D. Lower Long-term Industrial Rates

Total decontrol of wellhead prices will likely hold down industrial rates in another way. This benefit will result because the danger of discriminatory rate schemes, such as incremental pricing, end-use rate schedules, marginal cost pricing and inclining block rates, will be substantially reduced if all natural gas is being sold at roughly equivalent wellhead prices.

Those types of discriminatory rate schemes would allocate a disproportionate share of relatively high cost supplies to industrial users on the basis of the misleading claims that industrials are the "cause" of high-cost gas purchases and that they are "marginal users" who should keep new supplies in line (i.e., "order the market") while other users burn regulated cheap gas at below average cost. By eliminating the major basis for discriminating on gas cost allocations, true cost-of-service ratemaking will be more easily and consistently implemented for the benefit of all consumers.

Although some have suggested that the dangers of discriminatory rates are lower today as a result of widespread concern about the Nation's poor economy and the risk of plant shutdowns, industrial users doubt this. Even now, in today's economic circumstances, such discriminatory theories are espoused by some States (e.g., California), by some so-called "consumer groups," and even by some distributors (e.g., Laclede). (See comments filed in the FERC's Notice of Inquiry, RM82-26). Moreover, industrials are concerned that these arguments will be still more widely made, in healthier economic times, if there remains a wide range of wellhead gas prices. Consequently, ending the root cause of the problem--i.e., artificial differences in wellhead prices--will help to produce greater long-term price stability for pipelines, distribution companies, and consumers. That greater assurance of consistent, fair treatment will help immeasurably to restore industrial users' confidence in the natural gas system.

E. Greater Stability for the Entire Gas Industry

Just as industrial users would benefit, more consistent implementation of true cost-of-service ratemaking and economically rational pricing of wellhead sales will also produce greater long-term stability for distributors, pipelines, producers and non-industrial consumers. Long-term gas prices will be easier to project because there will be no artificial price discontinuities between categories of gas; and regulatory gamesmanship, such as "category creep" (in which old gas is reclassified into higher price categories), should cease to be a problem. Moreover, even-handed implementation of cost-of-service ratemaking will produce the greatest likelihood of stable resale markets, including industrial markets, which are vital to the long-term health of the natural gas industry.

F. Similar Production Levels

It is sometimes argued that deregulating only new gas will enhance exploration and development of new supplies because prices for new supplies would be subsidized by controlled old gas prices. At first glance, this sounds like an attractive proposition, especially to those who suffered from curtailments in the 1970's. However, while it is obvious that deregulating only "new" gas will affect the pattern of production, exploration and development, it is less clear what the net effect will be on overall production levels, as compared to the production which would occur if all gas is deregulated.

It is likely that deregulating only "new" gas will simply result in a situation in which wellhead contracts signed in the first year or two following such partial deregulation will command a price premium which effectively locks-up the economic benefits of the old gas cushion. New contracts signed thereafter would contain lower prices which would not be materially above the expected long-term market clearing level. In fact, there is significant evidence that this pattern is occurring under the NGPA: prices in new Section 107 contracts have reportedly fallen substantially from their 1980-1981 levels, and contracts with extreme deregulation provisions are standing by to offset any remaining volume of old gas cushion in 1985. Thus, the NGPA's relatively larger drilling incentives for new gas may have already come to an end; and the NGPA's long-term effect on supplies may be minimal.

On the other hand, if all supplies were deregulated, one might expect temporarily accelerated development and production of old supplies, since that would be the cheapest way for producers to obtain the benefits of deregulation in the short-term. However, that would soon be followed by increased exploration for, and development of new sources as producers saw that the old gas supplies would need to be replaced with new reserves. In addition, somewhat enhanced recovery of gas from old reserves would probably ensue from total deregulation, improving gas supply availability to some extent.

Comparing these alternatives, it is difficult to declare with any confidence that one yields greater supply availability than the other. The principal differences between the two alternatives might simply relate to the timing of reserve additions and production from particular sources of supply, not to total gas deliveries at any particular time. Thus, without more, arguments that decontrolling only new gas would increase supply more effectively than would complete decontrol are not persuasive.

Moreover, even if the implicit subsidies from an old gas cushion under partial deregulation increased near-term exploration for, and development of new gas, thereby enhancing supplies for a period, the longer term effect might simply be higher gas costs following exhaustion of the cushion. This could result if more rapid production of new sources during the period of old gas subsidies leaves the Nation with relatively more costly sources to develop, without the benefit of subsidies, thereafter.

V. CONCLUSION

On balance, complete deregulation of all wellhead prices for natural gas by a date certain, combined with a market-oriented resolution to the NGPA's contract problem, and prompt elimination of demand restraints, will produce the fairest and most economically efficient solution to the problems confronting the Nation's gas markets. The long-term health and stability of the natural gas industry and its customers, including industrial customers, will be improved by that action.

Any effort to retain controls on some or all categories of supplies will inevitably yield market distortions analogous to those experienced under the Natural Gas Act and the NGPA. Some of those distortions are predictable; others are not. Experience indicates, however, that the Nation will be hurt more by an extension of full or partial controls than by ending our unfortunate experience with wellhead price regulation as soon as possible.

The Process Gas Consumers Group appreciates this opportunity to present its views to this Committee. We will welcome the opportunity to work further with the Members and Staff of the Committee in addressing these vitally-important natural gas issues.

February 10, 1983

ECONOMICS OF NATURAL GAS DEREGULATION

FRIDAY, APRIL 15, 1983

Congress of the United States,
Joint Economic Committee,
Washington, D.C.

The committee met, pursuant to notice, at 10:25 a.m., in room SD-138, Dirksen Senate Office Building, Hon. Roger W. Jepsen (chairman of the committee) presiding.

Present: Senator Jepsen and Representative Lungren.

Also present: Chris Frenze and George R. Tyler, professional staff members.

OPENING STATEMENT OF SENATOR JEPSEN, CHAIRMAN

Senator **Jepsen**. I'd like to welcome the distinguished witnesses that have given their valuable time to come before us this morning. We'll hear their views on the controversy over natural gas regulation.

Obviously, something is wrong. Natural gas prices are continuing to move to record highs, even as surplus supplies accumulate.

That's just not supposed to happen. Water is not supposed to run uphill. Prices are not supposed to rise when the commodity is in surplus. But it is happening and the Joint Economic Committee would like to know why.

It seems apparent that, at least in the natural gas industry, the Congress has been successful in repealing the law of supply and demand. Perhaps we ought to try instead to repeal the law of gravity and then the oil and the gas would simply bubble up out of the ground and we wouldn't have to pay for those expensive drilling rigs.

The Natural Gas Policy Act of 1978 was supposed to provide enough deregulation to encourage exploration for new supplies, but maintain enough regulation to protect the consumer from predatory pricing.

Unfortunately, the law has failed miserably on the second point. The American consumer is being taken to the cleaners. Last winter, too many Americans were forced to choose between food and fuel. And I'm convinced that only the relatively mild winter saved us from the probability of a consumer revolt across the frost belt.

I do hope our witnesses here this morning will address themselves to the question of how we can assure the consumer that adequate supplies of gas will remain available without subjecting them to the certainty of evermore drastic price increases.

Two aspects of the current national gas crisis merit our special attention: the "take or pay" clauses in producer-pipeline contracts; and the indefinite price escalators in the Natural Gas Policy Act.

A take-or-pay clause obligates a pipeline to purchase a certain percentage of a production facility's output whether or not the pipeline can transmit this gas. Hence, the term "take or pay." Currently, many pipelines are committed to buying expensive gas they can't afford to take or pay for and the take levels frequently exceed 70 percent. Since many pipelines are locked into expensive gas, they aren't at liberty to switch to the cheaper gas available.

The indefinite price escalator clauses make this situation even worse. One version, for example, ties the price of the natural gas to whatever the maximum lawful price is. Unfortunately, the Natural Gas Policy Act of 1978 price-ceiling formulas assume that oil prices would remain at an inflation-adjusted $15 per barrel. But when oil prices shot up over $30 per barrel soon thereafter, this allowed the maximum lawful prices of the 30 or so categories of natural gas to jump also. Many contracts were liked to the various ceilings established by the National Gas Policy Act. This drove consumer natural gas costs sky high, regardless of market conditions. The NGPA has a number of other problems which we intend to explore in detail today.

As we all know, our people don't want to be subjected to another drastic natural gas price rise next winter. We don't have the luxury of having any more time to waste. We must change the Natural Gas Policy Act of 1978 now so it will work.

At this time I recognize Manuel Johnson, who I understand will present the administration's case for its deregulation package. Welcome, and thank you for coming. You may proceed.

And please know that any statement you have in writing, if you have one that has been submitted, will be entered in the record and you may proceed in any way you may so desire.

STATEMENT OF HON. MANUEL H. JOHNSON, ASSISTANT SECRETARY OF THE TREASURY FOR ECONOMIC POLICY

Mr. Johnson. Thank you. I do have a prepared statement to submit for the record and I will read a shorter statement, so as not to take up too much time.

Mr. Chairman and members of the committee, it's a pleasure for me to be here today to discuss with you the natural gas deregulation question. In the late 1970's, the President and the Congress realized that the existing regulatory arrangement regarding the pricing of natural gas was leading to increasingly serious shortages of crisis proportions. In response, the Natural Gas Policy Act was enacted into law. This act had two primarily elements. First, it imposed Federal price regulation on the intrastate gas market, thereby integrating the interstate and the intrastate market. And, second, it provided for a scheduled phasing in of price increases in order to avoid an abrupt increase in prices, yet achieve ultimate decontrol of prices for certain categories of natural gas.

Unfortunately, the NGPA has several flaws. Perhaps the most serious flaw is the linkage of natural gas prices to a target market price of oil based on a forecast for 1985. This provision thwarted the intent of the legislation if the price of oil behaved differently than the actual forecast. And indeed, that is exactly what has happened. A dramatic increase in the price of oil in 1979 and further subsequent increases made the prospect of a smooth transition less likely. And, in fact, there has been considerable concern in the past few years that these developments would result in a dramatic jump in the price of gas when it is partially deregulated in 1985.

Since 1980, however, the United States and other world economies have been in recession, although the U.S. economy is now on the road toward recovery.

The supply of oil has exceeded demand, which has fallen from previous high levels. Crude oil prices have actually declined and there's considerable agreement that a market clearing price for natural gas upon decontrol would be much lower than had been anticipated just 2 years ago.

Indeed, the weight of the evidence indicates that market clearing prices for natural gas are now below current regulated prices in many areas and current prices would actually decline in real terms if existing contracts between producers and pipelines are renegotiated and oil prices remain at current levels.

Gas prices have escalated sharply in recent years in part because they had been held so far below market clearing levels, but also in part because of the interaction of provisions of both the NGPA and private contracts. Contract clauses stipulate wellhead prices as a function of Government-controlled prices and have caused NGPA price ceilings to actually function in many cases as price floors. Thus, as those ceilings are gradually lifted according to NGPA formulas wellhead gas prices are driven upwards, regardless of the current state of demand or the current trend in substitute oil prices.

Past controls may also have encouraged the writing of very high percentage take-or-pay clauses. With previous price ceilings below market resulting in a situation of excess demand for gas, pipelines were precluded from bidding up the price to obtain supplies and had to resort entirely to offering producers higher levels of guaranteed demand; that is, higher percentages of take-or-pay contracts in order to obtain secure sources of gas.

Pipelines and consumers are now bearing the burden of these various contractual arrangements. As gas prices have escalated sharply, even in the face of declining demand, some users are starting to switch from gas back to oil. Because of high take-or-pay contractual obligations, however, some pipelines have found it necessary to take the most expensive gas supplies and shut in the less expensive supplies that are available.

Under take-or-pay, they must pay for the contracted percentages of both types of gas. But due to pipeline regulation, they can only pass on directly the cost of gas that's actually taken. Regulation, therefore, has had the perverse effect of driving prices higher at a time when falling oil prices and competition should be leading to lower gas prices.

Long-term contracts may, by themselves, lead to situations where average gas prices differ from those prices being paid on new contracts. The existence of price controls exaggerates this effect by limiting the extent to which automatic contract provisions may allow prices for gas being sold under existing contracts to adjust to current market conditions. Also, where the prices of some types of gas are not controlled, legislation causes producers to search for and develop these high cost sources of supply rather than more easily obtainable supplies that, because of controls, yield a lower return.

Pipelines with access to significant supplies of cheap price controlled gas, on the other hand, are able to bid up the price of new high cost, uncontrolled gas to levels significantly above the average price. This is because they're able to roll in or average the high price gas with the cushion of controlled or low price gas and still market their product at competitive prices.

The primary consequence of the regulation of natural gas is an inefficient use of economic rescurces. In prior years when the price of gas was kept below its opportunity cost, there were two effects. First, the present consumers of natural gas, who, for historic or other accidental reasons, had access to comparatively cheap energy, tended to use it in an economically inefficient manner. Other potential users, because of the price controls, were unable to secure access to the resource due to the lack of adequate supplies at control prices.

Second, price controls made it uneconomical, in many instances, to develop and market old reserves of regulated gas. Thus, producers concentrated on high-cost new-gas development, even though there may be plentiful reserves of lower cost gas to be developed.

Although the NGPA was well intended, it was flawed and has produced distortions and inefficiencies. The perpetuation of this situation does not serve the best interests of the Nation and must be corrected—by moving toward an environment where market forces determine demand, supply, and prices.

In the years before NGPA, wellhead controls only on gas destined for interstate commerce resulted in artificially low prices and produced depressing effects on exploration and drilling activity for the interstate market. Circumstances created a situation where the demand for gas exceeded the supply that producers were willing to make available. In effect, the controlled or administered price of gas was below the equilibrium or market clearing price. The resulting supply shortages led to passage of the NGPA.

After the NGPA was enacted, certain conditions changed dramatically. Natural gas prices have been rising as a result of scheduled price escalation under the NGPA and various contractual arrangements between producers and pipelines in spite of the fact that the demand for gas has been falling. Decline in demand is partly because of depressed economic activity and partly because the price of oil has declined in both nominal and real terms since 1981.

In addition, as the price of gas rises, the demand for gas is reduced. At present, the price of natural gas is most likely being held above its equilibrium or market clearing price, a situation that is consistent with current excess supply conditions.

If the administration's proposal is enacted into law, controls are removed, and contracts are renegotiated or eventually voided, I would expect that natural gas prices would decline to the market-clearing price, if that actually took place. This assumes the continuation of relatively low oil prices which I think is a reasonable assumption, given current conditions of the market.

The fall in natural gas prices would reduce the rate of inflation modestly and increase real economic growth and employment. Also, lower natural gas prices consistent with lower cost of supply would result in greater efficiency in the use of energy throughout the economy. Total-factor productivity could increase somewhat, and the shift of users from oil to lower priced gas would result in reduced oil imports.

As economic recovery takes hold, it is possible that natural gas prices could rise in real terms as the demand for gas rises. It's possible. If oil prices escalate little or not at all or even decline over the next few years, the demand for gas would not rise as rapidly as otherwise would be the case and natural gas prices, therefore, would not increase significantly.

It is important to realize, though, that even if the economic recovery substantially increases gas demand and gas prices rise, this situation would also occur under the continuation of NGPA, not just because of market decontrol.

Under current law, I think that we can expect natural gas price increases until and probably even after partial deregulation takes place in 1985. Underlying these gas-price increases are certain provisions in existing contracts that cause the price ceilings under the NGPA to act as price floors that rise with the rate of inflation.

After 1985 and partial deregulation under NGPA, one would expect gas prices to continue rising. NGPA price controls on old gas after 1985 would continue to subsidize the uneconomic purchase of more expensive, decontrolled gas.

At a time of large budget deficits, the imposition of a windfall-profit tax on decontrolled natural gas might be tempting. Even though Treasury supports a smaller budget deficit, we cannot support a windfall tax on decontrolled natural gas.

A windfall tax rests on the notion that, once a well is drilled, all costs have been sunk and the production rate and production life of the well are actually fixed. Therefore, any increase in price for the gas being produced from an existing well is pure surplus or windfall and can be taxed without negative supply implications. This is not entirely accurate.

While there may be some windfall profits involved, it is impossible to determine the precise amount of these profits. A windfall tax could easily take more than the windfall gain, and thus provide a supply disincentive.

At the other extreme, a windfall tax probably would not take into account windfall losses incurred by some producers.

As production continues from a gas well over an extended period of time, many things can happen to a well which may cause it either to reduce or even cease its production of natural gas. Nevertheless, there are a number of actions which can be taken to increase recoverable reserves. These actions, of course, require further capital expenditures. If the price of gas is subject to a windfall tax, the incentive to increase production from decontrol is significantly lessened.

If a natural gas windfall tax were to take a form similar to the oil windfall tax in which even new supplies of gas on the market would be subject to additional tax, the discentive supply effects would even be more apparent. It follows that the tax would lower gas supplies along several different production margins, implying higher energy imports and higher gas prices for consumers.

Another reason for not supporting a windfall tax is that the revenues may not be significant enough under currently accepted oil price assumptions to justify the expense needed to administer the tax. Further regulations would be needed to define, identify, and collect the revenue obligations, counter to the objective of this administration to reduce Government regulation and market intervention in this administration.

Finally, I would like to comment on the effect of gas deregulation on financial institutions. The natural gas decontrol bill should have little, if any, effect upon the banking sector. The only comment that we have heard from the banking community concerns the bill's override of existent contract provisions, such as the maximum level on take-or-pay percentages. Companies that specialize in producing deep and other categories of high price gas may experience declining gas revenues due to the decontrol.

As a consequence, such producers could have trouble servicing their loans. However, those incidents would cause significant problems for individual banks only if such banks had concentrations of loans to those specialized gas producers in their portfolios.

We anticipate that if such cases exist, they will be rare. We note, too, that the expected deterioration of income of such producers is already occurring. Pipelines have stopped contracting for new supplies at high prices and have negotiated down and actually walked away from high price contracts, and have even reduced take-or-pay purchases across the board on all contracts.

Mr. Chairman, this concludes my statement and I would be happy to answer any questions that you or your committee may have. Thank you.

[The prepared statement of Mr. Johnson follows:]

PREPARED STATEMENT OF HON. MANUEL H. JOHNSON

Economics of The Natural Gas Market

Mr. Chairman and members of the Committee;

It is a pleasure for me to be here today to discuss with you the natural gas deregulation question.

Background

Public policy has had a major impact on the structure and evolution of the natural gas industry. The Federal Power Commission (FPC) was originally given the authority to regulate interstate natural gas transportation and sales for resale in 1938. The FPC was required at that time to review rates and charges to determine whether they were "just and reasonable." The FPC did not interpret this authority as requiring oversight of wellhead pricing.

In 1954, in response to a Supreme Court decision (The Phillips Case), the Federal Power Commission assumed the authority to regulate the wellhead prices of natural gas which was sold across state lines. This action divided the natural gas market into two distinct structures: (1) an interstate market in which wellhead price ceilings were imposed, and (2) an intrastate market in which the price was primarily determined by market forces.

The implication of this decision was becoming evident during the early 1970's when the unregulated price of intrastate gas rose above the regulated price of interstate gas. As a result, gas producers tended to shift their output increasingly to the intrastate market. However, it was not until the mid-1970's, the oil embargo, and the dramatic increase in the price of oil, that the full implications of this dual market structure became clear. Since natural gas is a close substitute for oil in many uses, especially when used as a fuel for boilers by industry and utilities, the price of natural gas in the intrastate market rose substantially as users shifted out of high-priced oil into natural gas. As the price difference between the two markets increased, the amount of new gas dedicated to the interstate market declined and, by the mid-1970's, shortages developed.

In the late 1970's, the President and the Congress realized that the existing institutional arrangement regarding the interstate market was leading to increasingly serious shortages of crisis proportions. Thus, the Natural Gas Policy Act (NGPA) was enacted into law. This Act had two primary elements. First, it imposed Federal price regulation on the intrastate market, thereby integrating the interstate and the intrastate markets and, second it provided for a scheduled phasing in of price increases in order to avoid an abrupt increase in prices, yet achieve ultimate decontrol of prices for certain categories of natural gas. This legislation represented a compromise between groups who wanted to alleviate the shortage in the interstate market by simply expanding public jurisdiction over the total market and groups who wished to solve the problem by removing price controls from the interstate market.

Unfortunately, the NGPA has several flaws. Perhaps the most serious flaw is the linkage of natural gas prices to a target market price of oil based on a forecast for 1985. This provision thwarted the intent of the legislation if the price of oil behaved differently than forecast. And indeed that is exactly what has happened.

Changing world energy conditions quickly made the plan obsolete. When the legislation was passed in 1978, the price of oil was about $15 per barrel. The increases in new gas ceilings scheduled by the legislation were designed to bring the prices of new gas close to the BTU-equivalent price of oil by the time wellhead prices were to be completely decontrolled in 1985. The dramatic increase in the price of oil during the Iranian crisis in 1979, and further subsequent increases, made the prospect of a smooth transition less likely, and in fact there has been considerable concern in the past few years that these developments would result in a dramatic jump in the price of gas when it is partially deregulated in 1985.

Since 1980, the United States and other world economies have been in recession, although the U.S. economy is now on the road toward recovery. The supply of oil has exceeded demand, which has fallen from previous highs. As a result, crude oil prices have declined in both nominal and real terms since the first quarter of 1981. There is considerable agreement that a market clearing price for natural gas upon decontrol would be much lower than had been anticipated just two years ago. Thus, there are now mixed opinions on whether or not and by how much, if any, gas prices would increase when partial decontrol takes place. Indeed, the weight of the evidence indicates that market clearing prices for natural gas are now below current regulated prices in many areas and that current prices would actually decline in real terms if existing contracts between producers and pipelines are renegotiated and oil prices remain at current levels in real terms.

The Department of Energy has estimated, for example, that the Administration's natural gas proposal would achieve a nearly 4 percent decline in the real average wellhead price of natural gas in its first year of operation. Indeed, this estimate assumes oil prices that could easily prove to be too high. A more plausible oil price forecast utilized by DOE yields a real average wellhead price decline of over 11 percent in the first year of decontrol.

Market Characteristics

Unlike the oil market in which contracts are short-term and whose analysis can be usefully approximated by a spot market, the natural gas market is characterized by long-term contracts. Many of these contracts include various types of escalator clauses and requirements that pipelines pay for a high percentage of the deliverable gas, whether or not that gas is actually taken in subsequent years. The necessity of these "take-or-pay" contract clauses stems from several factors: pipelines are required to contract for certain gas reserve levels in order to meet anticipated future demand, and their large fixed costs have encouraged the pipelines to be highly concerned about the continuity of supply. Producers are also interested in long-term contracts, in order to protect their investment by ensuring that pipelines cannot arbitrarily walk away from contracts to buy gas.

Gas prices have escalated sharply in recent years in part because they had been held so far below market clearing levels, but also in part because of the interaction of provisions of both the NGPA and private contracts. Contract clauses that stipulate wellhead prices as a function of government controlled prices have caused NGPA price ceilings to function, in many cases, as price floors. Thus, as those ceilings are gradually lifted according to NGPA formulas -- often at rates in excess of the general rate of inflation -- wellhead gas prices are driven upwards, regardless of the current state of demand or the current trend in substitute oil prices.

Past controls may also have encouraged the writing of very high percentage take-or-pay clauses. With effective price ceilings resulting in a situation of excess demand for gas, pipelines were precluded from competing on the basis of price and had to resort entirely to offering producers higher levels of guaranteed demand -- that is, higher percentages in take-or-pay contracts -- in order to obtain secure sources of gas supplies.

Pipelines and consumers are now bearing the burden of these various contractual arrangements which, as events would have it, have not turned out to be in their best interests. As gas prices have escalated sharply, even in the face of declining demand, some users are starting to switch from gas to oil. Because of high take-or-pay contractual obligations, however, some pipelines have found it necessary to take the most expensive gas supplies and shut in the less expensive supplies that are available. They must pay for the contracted percentages of both types of gas but can only pass on directly the cost of gas actually taken. Obviously, most producers of this expensive gas are reluctant to let the pipelines disregard this take-or-pay contractual obligation. Regulation, therefore, has had the perverse effect of driving gas prices higher at a time when falling oil prices and competition should be leading to lower gas prices.

In the oil market it was expected that once the price of oil was deregulated, domestic market prices would adjust to the world market price and, in fact, that is what happened. In contrast, in the natural gas market, even if complete deregulation were implemented without renegotiation of contracts, many different prices could coexist because of contracts that were negotiated at different points in time with different price provisions.

The incremental pricing provisions of the NGPA have also been counterproductive. Designed to shield residential customers from price increases by shifting the costs of expensive gas to industrial users, these provisions have induced industrial users -- the natural gas consumers who may most easily substitute alternative fuels for gas -- to turn away from gas. As a result, residential customers have been forced to bear a greater percentage of the fixed costs of producing and delivering natural gas than they would have otherwise.

Long-term contracts may, by themselves, lead to situations where average gas prices differ from those prices being paid on new contracts. The existence of price controls exaggerates this effect by limiting the extent to which automatic contract provisions may allow prices for gas being sold under existing contracts to adjust to current market conditions. Also, where the prices of some types of gas -- deep gas in the case of the NGPA -- are not controlled, the legislation causes producers to search for and develop these high cost sources of supply, rather than more easily obtainable supplies that, because of controls, yield a lower return. Pipelines with access to significant supplies of cheap, price controlled gas, on the other hand, are able to bid up the price of new, high-cost, uncontrolled gas to levels significantly above the average price of gas. This is because they are able to "roll in" or average the high-priced gas with the cushion of controlled or old low-priced gas and still market their product at competitive prices.

Implications of Regulation and Deregulation of Natural Gas

The primary consequence of the regulation of natural gas is an inefficient use of economic resources. In prior years, when the price of gas was kept below its opportunity value, i.e., its free market price, there were two effects. First, present consumers of natural gas, who for historic or other accidental reasons had access to comparatively cheap energy, tended to use it in an economically inefficient manner. Other potential users, because of the price controls, were unable to secure access to the resource due to the lack of adequate supplies of controlled prices. Second, regulation has resulted in less supplies than would be optimal because of reduced profit opportunities. In addition, under NGPA, regulation has resulted in a mix of supplies that is more costly than necessary. For example, controls encouraged producers to search for deep gas which was completely deregulated under NGPA and to neglect other types of gas. Price controls made it uneconomical in many instances to develop and market regulated gas; thus, producers have concentrated on high-cost gas development even though there may be plentiful reserves of lower-cost gas to be developed.

Administration Proposal

Although the NGPA was well intended, it was flawed and has produced distortions and inefficiencies. The perpetuation of this situation does not serve the best interests of the nation and must be corrected -- by moving toward an environment where market forces determine demand, supply and prices. Because weak gas demand and price inflexibilities arising from the NGPA have resulted in excess supplies of natural gas while oil prices are declining, there may never be a better time to start this transition.

In the years before NGPA, wellhead controls only on gas destined for interstate commerce resulted in artificially low prices and produced depressing effects on exploration and drilling activity for the interstate market. This regulatory environment, along with greater demand for gas due to OPEC oil price increases and harsh winter weather, created a situation where the demand for gas exceeded the supply that producers were willing to make available. In effect, the controlled or administered price of gas was below the equilibrium or market clearing price. The resulting supply shortages led to passage of the NGPA.

After the NGPA was enacted certain conditions changed dramatically, leading to the situation that exists today. Natural gas prices have been rising as a result of scheduled price escalation under the NGPA and various contractual arrangements between producers and pipelines in spite of the fact that the demand for gas has been falling. This result is partly because of depressed economic activity and partly because the price of oil has declined in both nominal and real terms since 1981. In addition, as the price of gas rises, the demand for gas is reduced. Thus, gas price escalation has occurred in spite of declining demand, due to the workings of the NGPA. At present, the price of natural gas is most likely being held above its equilibrium or market clearing price, a situation that is consistent with current excess supply conditions. If there were excess demand, and we know there is not, one would expect the price of gas to be below the market clearing price, as it was prior to the enactment of NGPA.

Under the Administration's proposal, wellhead prices of natural gas in any new or renegotiated contracts between producers and pipelines would be allowed to function under their own terms. There are incentives for producers and pipelines to renegotiate existing contracts to reflect current market conditions. For contracts that are not renegotiated, there would be a gas cap determined by the average price for gas in newly negotiated and renegotiated contracts. After January 1, 1985, but before January 1, 1986, any contract not renegotiated could be broken by either party. If a pipeline is a party to an abrogated contract, it would be obligated to facilitate transportation of gas to another purchaser. Take or pay requirements in contracts could immediately be reduced to 70 percent, releasing any gas so affected to be sold to another party. Escalator clauses in contracts that provide for automatic increases in the gas purchase price of controlled gas would be limited so that prices could not rise higher than the gas cap. This limitation would begin four months after the bill is enacted and expire on January 1, 1986.

Consumers would be aided by a provision that would prohibit pipelines from automatically passing through to consumers the cost of gas purchased if the increase is greater than the rate of inflation. Larger increases would have to be reviewed by the Federal Energy Regulatory Commission in a public hearing.

The proposal also would establish a "contract carriage" provision whereby FERC could order an interstate pipeline to transport gas on behalf of any producer and purchaser. This provision would alleviate some of the price inflexibility problems inherent in the current institutional arrangements that rely on long-term contracting.

Finally, the incremental pricing provision under current law would be eliminated, as would the restrictions on gas use under the Fuel Use Act of 1978.

If the Administration's proposal is enacted into law, controls are removed, and contracts are renegotiated or eventually voided, I would expect that natural gas prices would decline to the market clearing price. This assumes the continuation of relatively low oil prices, which I think is a reasonable assumption.

The fall in natural gas prices would reduce the rate of inflation modestly and increase somewhat real economic growth and employment. Also, lower natural gas prices, consistent with lower costs of supply, would result in greater efficiency in the use of energy throughout the economy. Total factor productivity could increase somewhat, and the shift of users from oil to lower priced gas would result in reduced oil imports. Secretary Hodel has testified that oil imports could fall below current projections by 100,000 to 200,000 barrels per day in the first year following enactment of the proposal. At about $30 per barrel, and taking the midpoint of this estimate, the savings in our oil import bill could be as much as $1.5 billion per year.

As economic recovery takes hold, it is possible that natural gas prices could rise in real terms as the demand for gas rises. The magnitude would depend to some extent on what happens to oil prices. If oil prices escalate little or not at all or even decline over the next few years, the demand for gas would not rise as rapidly as otherwise would be the case and natural gas prices, therefore, would not increase significantly. In other words, continued low oil prices would tend to temper natural gas price increases by offering a price-competitive alternative to gas and thereby hold down the demand for gas. It is important to realize that even if economic recovery substantially increases gas demand, and gas prices rise, this situation would also occur under the continuation of the NGPA. Any reimposition of controls in this situation would cause severe shortages.

Implications of Continued Controls

Under current law, i.e., NGPA, I think we can expect natural gas price increases until and probably even after partial deregulation takes place in 1985. The price increases should not be dramatic so long as oil prices do not escalate sharply. Underlying these gas price increases are certain provisions in existing contracts, i.e., escalator clauses, that cause the price ceilings under the NGPA to act as floors that rise with the rate of inflation.

After 1985 and partial deregulation under NGPA, one would expect gas prices to continue rising although not very rapidly. Pipelines would continue to pay high prices for decontrolled gas but they would have continuing supplies of old gas, which would remain regulated and cheap, that they could roll in with this higher priced gas so that average gas prices remain competitive with oil prices. This means, in effect, that NGPA price controls on old gas after 1985 would continue to subsidize the uneconomic purchase of more expensive decontrolled gas as is now and has been the case since the enactment of NGPA. As supplies of old gas are exhausted, however, there would be less of a cushion to offset this higher price gas.

Windfall Profits Tax

At a time of large budget deficits the imposition of a windfall profit tax (WPT) on decontrolled natural gas will be tempting. Even though Treasury supports a smaller budget deficit, we cannot support a WPT on decontrolled natural gas.

A WPT rests on the notion that, once a well is drilled, all costs have been sunk, and the production rate and production life of the well are fixed. Therefore, according to this notion, any increase in price for the gas being produced from an existing well is pure surplus or windfall and can be taxed without negative supply implications. This, however, is not entirely accurate.

First, while there may be some windfall profits involved, it is impossible to determine the precise amount of these profits. Thus, a WPT would probably take more than the windfall gain, thus providing a supply disincentive. At the other extreme, a WPT probably would not take into account "windfall losses" incurred by some producers -- in some cases, the very same firms earning windfall profits.

As production continues from a gas well over an extended period of time, many things can happen to a well which may cause it either to reduce or even cease its production of natural gas. Water or sand intrusion are examples, as are changing reservoir pressures. Nevertheless, there are a number of actions which can be taken to increase recoverable reserves. These actions, of course, require further capital expenditures. If the price of gas is subject to a WPT the incentive to increase production from decontrol is lessened.

In addition, if a natural gas WPT were to take a form similar to the oil WPT in which even new supplies of gas on the market would be subject to additional tax, the disincentive supply effects would be even more apparent. It follows that the WPT would lower gas supplies along several different production margins, implying higher energy imports and higher gas prices for consumers. The benefits of decontrol on supply would be greatly mitigated.

Another reason for not supporting a WPT is that the revenues may not be significant enough under currently accepted oil price assumptions to justify the expense needed to administer the tax. For example, administering the tax would be complicated by the large number of contracts between gas producers, processors and buyers. Further regulations would be needed to define, identify and collect the revenue obligations. This, too, would be counter to an important objective of decontrol, i.e., reducing government regulation and market intervention.

Effect on Financial Institutions

Finally, I would like to comment on the effect of gas deregulation on financial institutions. The natural gas decontrol bill should have little, if any, effect upon the banking sector. The only comment we have heard from the banking community concerns the bill's override of existent contract provisions, such as the maximum level on take-or-pay percentages. Companies that specialize in producing deep and other categories of high-priced gas may experience declining gas revenues due to decontrol. As a consequence, such producers could have trouble servicing their loans. However, those incidents would cause significant problems for individual banks only if such banks had concentrations of loans to those specialized gas producers in their portfolios. We anticipate that if such cases exist, they will be rare. We note, too, that the expected deterioration of income of such producers is already occurring. Pipelines have stopped contracting for new supplies at high prices, have negotiated down and walked away from high-priced contracts, and have even reduced take-or-pay purchases across the board on all contracts.

Mr. Chairman, this concludes my prepared statement. I would be happy to answer any questions that you or the Committee may have.

Senator JEPSEN. Just semantics, but for clarification, did you consider the so-called windfall profits tax on oil an accurate description of what the tax really was?

Mr. JOHNSON. No. I think that it was clearly an excise tax.

Senator JEPSEN. I think so, too. But a lot of people were led to believe it was a windfall profits tax. The profit had nothing to do with it.

Mr. JOHNSON. That's correct. It was a variable excise, and it did not relate well to taxes on windfalls.

Senator JEPSEN. We're here to talk about how do we bring about a market price related to supply and demand for natural gas.

Natural gas markets are skewed, distorted, and way out of whack right now.

Mr. JOHNSON. Right.

Senator JEPSEN. Do you think that the price of natural gas would rise or fall in the long run under the administration's plan?

Mr. JOHNSON. Well, as I stated in my prepared statement, under the administration's proposal, we think that it's most likely that the price of natural gas would fall rather than rise. There are several reasons why we believe this, but certainly, current market conditions indicate that there's an excess supply of natural gas in the market. New contracts are being negotiated at prices below the controlled price. Pipelines are trying to renegotiate existing contracts and, in some cases, have walked away from existing contracts, which would indicate that competitive conditions are such that there is an excess supply in the marketplace, not an excess demand.

This would simply demonstrate that the market clearing price is below the currently contracted prices and the controlled price and, therefore, there would be every reason to suspect, that under a decontrol situation, prices would fall to the market clearing level.

We're not certain about the situation in the long run. It's always possible that prices could rise again because of a Mideast disruption, some sort of a cutoff of oil supplies to the United States. But if that were to actually occur, we would be much better off under a decontrol environment than a control environment because we would be production incentives for natural gas which would increase the availability of natural gas and provide a ready substitute for crude oil.

So I think that either way, whether prices rise in the long run or whether they fall, we're better off under a decontrol environment.

Representative LUNGREN. Mr. Johnson, I'd like to ask a question with respect to—a general energy question. There are some who have been in to see me, constituents and so forth, who are very concerned that if we go to decontrol there will be no upper limit on what the price is going to be, and suggest that somehow, there's no competition in the natural gas market.

Could you comment on that? My thought is that our experience with petroleum, both before we decontrolled and thereafter, suggests that within our economy there is a tremendous amount of potential substitution. Likewise, if natural gas is ultimately decontrolled, there would be competition among alternative or substitute sources of energy and that natural gas producers would have to compete with producers of other forms of energy.

Mr. JOHNSON. Well, I think it is quite true that the energy industry is a highly competitive industry. There are large numbers of producers of both natural gas, crude oil, and obviously, there are thousands, millions of consumers.

Certainly, it would be very difficult for any producer to try and set price, in some monopoly fashion, above what the market clearing price would be, simply because of the competitive nature of the market. Such a producer would be undercut by other competing producers and, therefore, forced to reduce the price back to the market clearing level.

I think it's very clear that we have that kind of arrangement in the energy market. This has certainly been the case with crude oil and all the other close substitutes.

So I would think that without artificial regulations that might insulate markets from each other, that we would certainly have something resembling market conditions.

In terms of natural gas in particular, there are some technical differences between natural gas markets and crude oil. Natural gas is not easily traded in the spot market. The pipelines that transport the gas have very high fixed costs and they have to cover these costs by insuring constant availability of supply.

In order to insure supply, the pipelines are willing to negotiate long-term contracts, much longer than the crude oil market. And therefore, it's quite possible that you could have specific contract prices that might lie above the current market price for natural gas for at least the duration of that contract. Under the market environment for natural gas, it would be highly unlikely that general contract prices, once those contracts were renegotiated or new contracts were negotiated, would stay above the market clearing price.

There are more rigidities in the natural gas market, but it's still a competitive market and it certainly works over any reasonable period of time toward keeping prices in line with supply and demand conditions.

I think it would be unreasonable to assume that the price of natural gas could be maintained well above the market clearing level unless there was some sort of artifically controlled mechanism that did so.

Senator **Jepsen**. For the record, let's explore this comparison that's often used between natural gas and the oil markets with respect to decontrol.

I'll make some statements that I think are true and please verify them. First, there are about 100 pipelines. Generally, most communities are served by a single natural gas pipeline. About 25 of the 100 U.S. pipelines probably conduct the lion's share of the business. And in the gas distribution business, we have hundreds of thousands of gas stations.

For now, let's just have the record show those—I don't want to debate the difference, but there is a difference.

Mr. **Johnson**. That's correct, yes, sir.

Representative **Lungren**. Under present law, which mandates controls, isn't it true that because of the substitution availability, we've had the phenomenon of a significant number of industrial users switching from natural gas to alternative sources, which then has the effect of distributing the cost, which, as you've indicated is sometimes above the market clearing level, on the residential users. If we were unregulated and you didn't have that incentive for the industrial user to go outside that market, you would not have the increased costs being borne primarily by the residential user.

Mr. JOHNSON. I think that's accurate. The fact is that the higher cost natural gas has caused substitution back toward oil and there has also been a decline in demand resulting from the recession that we've just come out of. The higher price natural gas due to contract arrangements tied to the NGPA control accelerator clause has been a very important factor in depressing demand for natural gas.

Therefore, regulation for natural gas has resulted in substitution toward cheaper types of energy. Industry has become very efficient in designing technology, fuel technology that allows it to shift among energy alternatives. Artificially high gas prices have caused consumers to bear the brunt of natural gas costs because these costs have to be spread over the entire rate base. And if there are fewer industrial users, due to substitution, then these costs have to be allocated among a narrower group. And if this narrower group consists of residential consumers, then they experience increases in their rates and regulation is partly a result.

Senator JEPSEN. Why do you think this change took place with the industrial users? Most of them I've talked to indicate that natural gas has some attributes that are on the plus side when you come to handling and cleanliness, and so on.

Mr. JOHNSON. Sure.

Senator JEPSEN. So they sure don't change because they don't like it.

Mr. JOHNSON. I agree. I think that there are a lot of industrial users that might prefer natural gas as an energy source. But I think the major problem is the perverse incentives that have come out of the Natural Gas Policy Act, where you have had decontrol of new gas and the actual controls remaining on old gas which has already been discovered and is in reserve. Under take-or-pay clauses, the pipelines have to pay for the natural gas, whether it's low cost or high cost, whether they take it or not. And because the regulation on natural gas pipelines requires that you can only pass on the cost of the gas that you actually take, pipelines have a strong incentive to actually take the high cost gas, leaving the low cost gas in place. Pipelines are able to pass the higher costs on to consumers and thus, increase the cost of natural gas, simply because they would rather pass on the cost of this high priced gas if they have to pay for both, which they have to do under take-or-pay contract. And this creates a problem.

As long as you have low cost gas or old gas consistently regulated at lower prices than new gas, then there's always an incentive to develop and purchase new higher priced gas and even bid up the price of that gas well above the market clearing rate because you can roll in that high price gas with the lower priced gas that you may have purchased and have the average price still stay close to the market price.

So there are really perverse incentives under the very complicated arrangement of controls and I think that this has a lot to do with why industrial users have been forced by high priced natural gas to substitute for other types of energy fuels.

Senator JEPSEN. Is it true to say that today we find many pipelines locked into long-term commitments to purchase expensive gas they can't sell? Is that an accurate statement?

Mr. JOHNSON. That's correct.

Senator **Jepsen**. How will the administration's proposal remedy that?

Mr. **Johnson**. The administration proposal would, beginning in 1985, allow the decontrol of all new contract arrangements, and the actual decontrol of all current contract arrangements, if they're renegotiated voluntarily before 1985. There would be an allowance period for the voluntary renegotiation of all existing contracts, which, would most likely be at the market clearing level. We anticipate that market clearing prices will be below the current contractual level.

If pipelines and producers do not choose to renegotiate contracts voluntarily, rather than have the price of natural gas rise at the rate tied to the NGPA escalator clauses, there would be a cap placed on the prices of the natural gas under continued contractual arrangements that would require that the price not be allowed to rise faster than some weighted average of the prices agreed to in new and renegotiated contracts.

After 1985, there would be an allowance—if contracts were not voluntarily renegotiated, which we expect they probably will be, because that's already happening even without our proposed legislation—for either party of a contract to walk away from that contract. The proposal gets technical at this point, because the pipeline would be required, if it walked away from, or if either party walked away from a contract to transport that natural gas to a user, or to some distributor, on behalf of the original producer, simply because of the way pipeline contracts work. Usually, producers negotiate with a single pipeline. They don't have other alternative sources to transport their gas. So there would be some requirement that the pipeline actually transport the gas, even though the contract has been broken. The administration proposal would provide some financial incentive for the pipeline to actually transport that natural gas.

Representative **Lungren**. Mr. Johnson, if you talk to the average person on the street, and you ask them the question, are you for energy independence for the United States, and they'd say, absolutely. And then you suggest to them that that might cost them a little bit more, and they'd say, well, let me think about it again.

When we were debating the whole issue of deregulating petroleum, many of us who argued on behalf of it suggested that that would help us in our effort toward energy independence and if there were one thing that we could do to break the back of OPEC, it would be to decontrol petroleum. I happen to think that that is one of the reasons that we had some influence on that situation in the overall price.

But it's awfully tough to argue in economic terms to your constituents, to the consumer out there. You've done a fine job of showing that you're an economist and showing how complicated this is. But how do you answer the question of someone who says to you, look, I have to rely on natural gas to heat my home. Prices have been going up. Sure, inflation's down, but I'm worried about this down the line. And now you folks in Washington, right at the time that I see some light at the end of the tunnel, are saying to me, hey, the best thing for you now is to decontrol natural gas. And I'm a consumer and all that. All I know about decontrol is that means the Federal Government isn't going to protect me against higher prices.

Any answer to that?

Mr. **Johnson**. First of all, I think that, the Federal Government has done a fairly poor job of protecting them against higher natural gas prices, if that was the purpose. In fact, the result of the NGPA under current market conditions has been to actually keep the price up above what the market would allow.

So I think that, clearly, decontrol would be to the benefit of everyone, consumers and producers.

Second, I think that even if the price were to rise because of declines in supplies due to some sort of disruption, or just simply an increase in demand, one thing that's guaranteed by market-determined price levels is the permanent availability of natural gas for those people who want it.

Representative **Lungren**. Can I just butt in there?

Mr. **Johnson**. Yes.

Representative **Lungren**. You talk about the prices could go up if we have some problem in the Middle East, if there's some interdiction of oil supplies here.

Isn't it a fact that, to the extent that we could have any impact, a more plentiful supply of natural gas, of which we have a much more available supply than petroleum in relative terms, would basically be the best cushion we'd have.

Mr. **Johnson**. Well, absolutely. Even under periods of rising prices, the increase in the market equilibrium price would certainly provide additional incentives for producers to explore and develop new sources of natural gas and, therefore, make more available domestically. This would continue to alleviate our dependence on foreign sources of energy.

Representative **Lungren**. Let me just ask one last thing, then. The chairman has pointed out that there are differences, obviously, in getting the product of natural gas to the consumer, the ultimate consumer, as opposed to petroleum products. But you've indicated that in the proposal for the administration, with respect to that question, you have made some requirement for the pipeline owner to have a continuing or additional obligation to make available that pipeline to a producer in the event that the pipeline owner walks away from that contract; is that correct?

Mr. **Johnson**. That's correct.

Representative **Lungren**. And that's an accommodation to the fact that there is a difference in terms of the distribution network?

Mr. **Johnson**. Yes, because of the method of distribution, pipelines would, if, in fact, they have capacity available, be required to transport natural gas for the producer. The pipeline would actually receive a fee that would cover their costs, plus, I think, an additional 5 cents per thousand cubic feet for transporting the natural gas.

Representative **Lungren**. Thank you.

Senator **Jepsen**. Thank you, Mr. Johnson. I have been advised that you are also to testify before the Banking Committee this morning. You're a man on the move and in demand. We may come back again at a later hearing and ask you to return. I thank you for your testimony today.

Do you have any closing statement or anything that you would like to add?

Mr. **Johnson**. No, I think that does it.

Senator **Jepsen**. Thank you.

Mr. **Johnson**. Thank you very much, Mr. Chairman.

Senator **Jepsen**. Thank you. Now Mr. MacAvoy of Yale University, Joshua Twilley of the National Association of Regulatory Utility Commissioners, and Mark Cooper, Consumer Energy Council of America, if you would come forward, we will receive your testimony.

I also advise, Mr. MacAvoy, that we will hear the statements of all three and then we will ask that any questions for you be given to me, because I have been apprised of the fact that you do have a meeting at the White House at 12 noon. And we certainly don't want you to be late for that.

I would respectfully suggest that we might limit your remarks, your opening remarks, to 10 minutes, if you can, or less. I would also, for the record, advise you that your prepared statements will be entered in the record.

So you may proceed in any manner that you wish. We'll start with Mr. MacAvoy—do I pronounce that correctly, MacAvoy?

Mr. **MacAvoy**. Yes, thank you, sir.

Senator **Jepsen**. You may proceed.

STATEMENT OF PAUL W. MacAVOY, FREDERICK WILLIAM BEINECKE PROFESSOR OF ECONOMICS, YALE UNIVERSITY

Mr. **MacAvoy**. Thank you very much, Senator. I certainly agree that there's no reason for me to reread my statement. I would, in substitute for that, take very few minutes to make five remarks concerning the current situation and then attempt to undertake some projections on the future situation based on a small-scale economic model of the natural gas industry that I have been working on at Yale with my graduate students and associates in recent months.

The five initial remarks of a sentence each can be divided between three remarks on the current regulatory condition and two remarks on the supply-demand condition.

With respect to the regulatory conditions, first of all, it's difficult for a professor to understand the present condition of astonishment in the House and Senate with natural gas prices rising out of keeping with supply and demand conditions, because in the universities we spend considerable time describing exactly those conditions with respect to a number of the regulated industries. One can determine at the present time that basic exchange charges for the use of telephone service in this country are doubling without regard to demand or supply conditions, that electricity charges in recent years have been subject to the so-called ratchet, which are really the recovery of earlier year cost increases without regard to the recessionary conditions the economy has been in since 1980.

With respect to airline services, before substantial deregulation occurred there, it was called the classic ratchet, that there was a tendency under regulation for rates to increase as capacity utilization. In that case, passenger fares to increase as capacity utilization declined.

So this is not at all unusual and I believe is part of a classic pattern of regulatory response under conditions of a soft economy.

Second, I wish specifically to state that the take-or-pay and favored-nations clause aspects of the contracts with which you gentlemen are so concerned today are a product of the regulatory process. One does not find contracts calling for take or pay at the 90 to 95 percent level in the unregulated market conditions that existed before the passage of the NGPA in intrastate contracts, nor is it possible theoretically to conceive an argument for those in the absence of regulation.

But when regulation establishes vintage conditions of pricing by which some prices are lower than other prices, and the new contract prices have the highest level in the vintage, then the sellers under the new contract have to have take or pay in order not to be withheld or stopped.

Because of the vintaging of the price, we have the take-or-pay and favored-nations clauses. And if we had not vintaged prices in the 1978 NGPA, we would not have this current condition of prices rising without regard to market conditions because of the take or pay.

The NGPA has a number of misfiring missiles as part of the basic structure of that act. Incremental pricing is unfounded. It has had a tendency to create ratchets with respect to consumer prices. The indexing of 102, 103 section field supply prices on oil price increases was, as you have already stated, totally unfounded as a set of forecast conditions.

The allocation of markets for industrial consumption of energy under the FUA, the Fuel Use Act, and the PURPA, has had a tendency to cause the development of a lag structure putting over excessive price increases on consumers.

The only way that one can, within the university context, describe these conditions is essentially that in the Carter administration, and I wish not to go back and dwell on their sins, that there was a certain arrogance of ability to handle a highly complex market through a piece of statute legislation that was supposed to last for a decade that one does not now see. And I wish that we would move forward within the context of a bit more humility with respect to how these complicated markets work to make changes in the future.

In present time, demand for natural gas is building ominously. If one goes through the contract commitments of the major pipelines to retail utility delivery companies and to industry. I think you get the notion that in this period of soft demand, a great deal of field activity is being undertaken by the wholesalers and retailers to build markets, to build markets without regard to future market conditions of supply availability.

My meager records in New Haven indicate there's been a tendency to add about 3 to 4 percent additional consumers to the stock of demanders facing the pipelines each year since 1978. This has not been manifest in growth of demand of 4 plus, 5, 6 or 7 percent because of the impact, the negative impact, of the highly depressed conditions in the manufacturing sector, principally in the Midwest part of the country, since the beginning of the recession in 1980.

The demanders are there. They are not purchasing in keeping with full employment conditions of utilization of energy. When we return to full employment, if ever, then we will have a situation where not only the existing demanders, but future commitments to new demanders will cause the rate of growth for demand for natural gas to rise more rapidly than in keeping with the recovery under the business cycle.

At the same time, regardless of thousands, if not millions, of words of rhetoric with respect to incentives for increasing supply that were supposed to come out of the Natural Gas Policy Act, or out of changes in the Federal Power Commission area rates before the act, supply as a production condition has been diminishing over time. The expropriation of the unregulated intrastate gas creating the so-called gas bubble of 2 to 3 trillion cubic feet, made available after the NGPA to the interstate users, has essentially been completed.

If one looks at reserve, accumulation experience, our reserves are still declining in this country. Productive capacity has to decline with a decline of recoverability from existing reservoirs.

So that, essentially, demand is building and supply is diminishing at the present time.

What does this say about the future? You'll see in my testimony some attempts to divine that from a very small scale econometric model of the economy, which essentially can be summarized as follows. With respect to the reserve availability condition, if prices were to stay at present levels, which is the baseline forecast, then reserve availability will be sufficiently reduced to reduce production capacity by almost 2 percent per year, 1984, 1985, 1986, 1987.

With respect to the demand conditions, the primary determinant of demand change according to this model over the next 5 years is going to be the sensitivity of response of demand to rising gross national product and per capita incomes. I essentially produced a measure of the sensitivity in the range of 50 percent, so that for any 1-percent increase in GNP, you've got a half-percent increase in the demand for gas in the residential, industrial, electric utility, and transportation sectors. That is a gross sensitivity measure across different measures that are given in footnote 5 of my prepared statement.

Price elasticity is much lower than income elasticity and the combination of the two lead me to believe that if we were to believe the administration's forecasts on recoverability, we should experience an increase in demand from the existing stock of consumers of between 3 and 5 percent per annum each year in the next 5 years. That's essentially about three-fourths to a trillion, a full trillion cubic feet in each year of that period.

At the same time, because of this growth in the customer stock that I mentioned earlier, I believe we should get another 2-percent increase in demand for those reasons as well. That says a couple percentage points' decline in supply each year and 5-plus percentage points' increase of demand.

If we were to continue the NGPA in place over the next 5 years, according to this model projection, at least, with moderate GNP growth and no real price increase in crude oil, we won't get very much price increase next year. In real terms, at the wholesale level, it will be something of the range of 1 to 1½ percent. If you add 4 or 5 percent of inflation recovery and you realize that this is at the wholesale level and does not take account of the cost of retail delivery, which may be one-third or one-half of the total, then we're talking about a minus 5-percent increase according to the NGPA. But over a 3-year period, that should be about a 34-percent increase. And over a 5-year period, about a 92-percent real increase.

Those are, again, with moderate oil price changes, zero oil price changes in effect, and the baseline Feldstein, more or less pessimistic GNP growth forecast.

I don't believe that Feldstein is going to make it and that the low GNP growth forecast, in keeping with the massive budget deficit now being built by Congress, is going to result in price increases that are much less than that because the demand for gas will grow much more slowly than under recovery of the economy.

That demand growth, however, is sufficient in this projection to bring the real price of gas in 5 years up by about 55 percent of the present or 1983-dollar level. There I'm talking about an increase on a base of about $2.70 an mcf of another $1.35.

If, however, we were to deregulate gas, and that is not to pass the administration's bill, because I do not believe that that is a deregulation bill, but rather, we were to eliminate take-or-pay clauses and favored-nations contracts, and put 102 gas on the same basis as 104 gas, as 107 gas, within the near future, which would be toward the end of the fourth quarter of this year, I would predict that we would get again some slight price increase the first year. In the second year, however—I'm sorry—in the first 3 years, however, according to my table 2, rather than a one-third price increase in keeping with the NGPA, you'd get only a 20-percent price increase. And, again, with the Feldstein projections, rather than a 93-percent price increase in 5 years, you'd get the 82-percent increase.

Given my projection of the terrible state of this economy, because of the fiscal deficit and the tight money policies of the Federal Reserve, I would expect that we would have essentially no price increase under deregulation in the first 3 years. That contrasts strongly with the continuation of the ratchet under the NGPA, but over a 5-year period, because of the systematic decline of supply of 1 or 2 percent a year, even with deregulation, you're going to get a 40-percent price increase rather than a 50- to 55-percent price increase under the low GNP forecast.

I can only add a couple points with respect to the administration's bill as a third scenario. First, I don't understand the bill because it has many more complications than the NGPA and is in the tradition of the Carter administration's proposals that when faced with political resistance to deregulation, you lay down a smokescreen of incredibly difficult, complex clauses in the legislation which is supposed to buy off some small special interest group, in return for which you get the bill passed, but in return for which you have no idea where it's all going to come out.

In this case, there are provisions to lock in prices in the form of the price cap, which I would take to be a reverse of the NGPA and more regulation. On the other hand, they claim that there might be some deregulation resulting from renegotiation of existing contracts.

I can't conceive that 107 contracts will be renegotiated, since under take or pay, at a price of $7 an mcf, they're receiving prices that are much higher than the market clearing levels. I can't conceive there will be substantial renegotiation of any contract in the 102 or 103 category above the present average price level because the present average price level is too high. So renegotiation would take those prices down as well.

So I don't see what the gains are from renegotiation. I see that there will be substantial caps created by using any average price to ratchet old contract prices.

With respect to the incremental pricing provision being eliminated under the PURPA and FUA, I would expect that that would result in additional gas demands.

So by controlling price, adding to demand, you might work out a part of the ratchet because you might get all the take-or-pay clauses under 90 percent operating and go back to consuming a little bit more of the old gas. But with the market conditions being already those of very rapid increases of demand, as the economy partially recovers, and reductions in supply, as reserves run out, this kind of control can only produce a price explosion in 1985, when most of the requirements come off.

I think this is postponing the issue. It's complicating the issue. It has some of the arrogance associated with the Carter administration's approach in the NGPA of thinking that you can manipulate specific contracts in a highly predesigned way against a complicated market and make the system succeed. And consequently, I am confused by the administration's position.

With all those kind remarks, I'm willing to turn it over to Mr. Cooper, who is known to be even more inclusive on these issues than I.

[The prepared statement of Mr. MacAvoy follows:]

PREPARED STATEMENT OF PAUL W. MACAVOY

My name is Paul W. MacAvoy, and I am Frederick William Beinecke Professor of Economics at Yale University. In recent years I have carried out extensive research on the regulated sector of the economy, particularly with respect to the oil and natural gas industries. While serving as a member of President Ford's Council of Economic Advisors, I was co-chairman of the President's Task Force on Regulatory Reform, which considered issues of natural gas deregulation. Earlier as a faculty member at the Massachusetts Institute of Technology, I built the first large scale model of the natural gas industry with National Science Foundation auspices.

My statement centers on the failures of the Natural Gas Policy Act and the need to deregulate natural gas sales at the wellhead. Regulation, which kept prices too low and thus caused severe shortages in the late 1970's, is now causing substantial price increases without regard to the current natural gas surplus. When Congress passed the NGPA, it was to provide disincentives for the reworking of old wells to generate additional supplies of cheap gas but strong incentives to produce and sell gas from the most expensive deep wells and tight sand sources. In 1981 new contracts were signed for as much as $10.00 per Mcf, twice the cost of energy equivalent supplies of oil. Because of this price structure, the NGPA created severe disparities in charges to consumers across regions of the country. The natural gas "cushion," consisting of the inexpensive old gas, has varied in availability significantly among the pipelines, so that the average or "rolled-in" cost of natural gas at the wellhead varied between the regions serviced by different pipeline transmission companies.

Even so, the most dramatic impact of the NGPA has been caused by the "take or pay" clauses in supply contracts. Pipeline contracts have included clauses that have prevented them from eliminating high cost sources from their supplies of natural gas as demand has declined over time. The combination of "take or pay" or "minimum monthly bill" clauses, and the rules for passing through natural gas acquisition costs force pipelines to take expensive gas in order that they may pass the costs on to their customers. Pipelines have found it cheaper to shut in cheap gas supplies than to eliminate high cost supplies.

The distortions existing in the natural gas market today can be credited to "phased deregulation" under the NGPA. In fact, the NGPA is a more complex version of regulation than any that preceded it. In order to evaluate its effects on the gas industry I have developed a computer model to forecast conditions in gas markets under varying policy and economic assumptions.

In this model the supply of natural gas is divided into eight different pricing categories as defined by the NGPA. Production, reserve additions, developmental and exploratory drilling are measured for each category. The average price of natural gas is the weighted average of the price ceilings for each category.[1] The price of deregulated natural gas adjusts to equilibrate supply and demand.

Supply for each category is an exponential function of the amount of reserves, the rate of production to reserves and the production associated with new drilling. This supply function reflects the gradual decline in the rate of production from a fixed stock of reserves.[2] In turn, total reserves are the sum of the previous level of the stock and of new discoveries less the previous level of production. Reserve additions from new discoveries are proportional to the level of exploratory drilling. This proportion, the amount of natural gas discovered per foot of exploratory drilling, declines over time as cumulative drilling increases.[3]

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[1] Imported natural gas, offshore gas, and Alaskan Prudhoe Bay natural gas are treated separately in addition to the eight NGPA natural gas categories.

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[2] $S_t = (R_{t-1})[1 - \exp(-S_{t-1}/R_{t-1})] + NS_t$

[3] Reserves R_t are as follows:

a) $R_t = R_{t-1} + NR_t - S_{t-1}$

b) new discoveries $NR_t = (F_t)(DR_t)$

c) with drilling DR such that

$$\frac{\Delta DR_t}{DR_t} = \epsilon_p \frac{\Delta P_t}{P_t} + \epsilon_c \frac{\Delta DC_t}{DC_t} + \gamma_1 \frac{\Delta DR_t}{DR_{t-1}}$$

and P_t = average wellhead price in year t

DC = average drilling costs per foot in year t

d) find rate $F_t = \delta_1 + \delta_2 \exp(-\delta_3 \sum DR_t)$

where $\sum DR_t$ is cumulative drilling since 1970.

Supply Equation Parameters:

	Developmental Drilling	New Field Exploratory Drilling	Other Exploratory Drilling
ϵ_p - Gas Price Elasticity	.38	.10	.18
ϵ_c - Cost Elasticity	-.001	-.002	-.026
γ_1 - Lagged Drilling Coefficient	.41	.71	.61

	Deep Gas (107)	New Gas (102)	Old Gas (103-104)
δ_1	0	30.0	--
δ_2	600	684.0	--
δ_3	50.38E-6	0.25E-4	--
β_1	.53	.77	.77
β_2	17180	7121	5067

There are other sources of additions to reserves besides those from drilling more wells. Most of these are extension and revisions, and in distinction from discovering sources of reserves additions, they remain a constant percentage of new discoveries.

Development drilling adds to production without generating new reserves. Production from new successful development wells is added to production from old wells to give total production. But production from new wells also increases the production to reserve ratio and consequently increases the rate of production from a natural gas field in future years.[4]

Certain trends follow from present conditions and these relationships. Assuming no increase in the price of gas, and given the 1982 stock of reserves along with the expected level of new reserve discoveries, production capacity will fall almost two percent per year in 1984 and 1985. But increases in the average price of gas expected under the NGPA in 1983 and 1984 have to be introduced into this framework. These increases reduce the rate of decline in production, but do not maintain the level of deliverability that will be needed to meet demand increases in the late 1980's.

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[4] New well production $NS_t = (W_t)(S'_t/W_t)$

where W_t is the number of new wells drilled that year, and S'_t/W_t is the average production from a new well that year. But W_t equals:

a) $W_t = \beta_1 DR_t / \beta_2$

where β_1 is the parameterized success rate of producing wells and β_2 is average depth per development well.

Thus, equally critical in determining natural gas price changes is demand growth. The magnitude of increase in demands from customers presently on distribution systems can be estimated using this model, for each major sector of the economy, residential and commercial, industrial, transportation, and electric utility. The controlling elements of such demands are price, the price of oil, and national income levels. The level of capacity utilization replaces GNP in the industrial demand equation as the principal measure of economic activity.[5] With customer growth of one percent per year, and additional use per customer based on economic recovery, total demands should grow by more than two percent per year.

With annual growth rates of three to four percent in income, it follows that residential, commercial, and industrial demands for gas increase by between three and five percent in each of the next three years.

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[5] The form of the demand equations for each of four sectors is as follows:

$$\frac{\Delta S_t}{S_t} = \alpha_1 \frac{\Delta I}{I} + \alpha_2 \frac{\Delta P_o}{P_o} + \alpha_3 \frac{\Delta P_t}{P_t} + \gamma_2 \frac{\Delta S_{t-1}}{S_{t-1}}$$

where I is a measure of income, P_o is the price of free oil, and S_t, P_t are as given in the supply equations.

Demand equation parameters:

	Residential/ Commercial	Industrial	Electric Utility	Transportation
α_1 - Gas price elasticity	-.11	-.13	-.11	-.20
α_2 - Income elasticity	.65	.32	.48	0
α_3 - Oil price elasticity	.05	0	.11	.26
γ_2 - Lagged demand coefficient	.79	0	.58	.60

These trends in supply and demand are sensitive to price changes, economic growth, and the price of oil, but they are clearly in the direction of increasing demand and falling supply.[6] They are not to be confused with the present surplus condition. An estimated one to two trillion cubic feet of natural gas production capacity is currently in surplus. Pipelines have had to cut back gas acquisitions to below "take or pay" minimum levels and entirely eliminate production from their own gas wells.

This current condition will be exacerbated by the continuation of the NGPA. Price ceilings will continue to rise and pipelines will continue to take expensive gas because of contract obligations even when cheaper gas is available. Table One shows the effect on prices after one year of the status quo NGPA condition. Under moderate growth and oil price conditions, the status quo is expected to add from 1.1 to 1.4 percent to real or constant dollar gas wholesale prices. The high cost supplies expand by enough to more than match any increases in demands, so that cheap gas shut in by contract take-or-pay obligations won't return to full capacity for several years.[7] Tables Two and Three

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[6] There is the additional question as to whether excess demand in 1984-1985 could be effectively eliminated by additional imports of gas principally from Canada. The answer is exceptionally difficult to determine because availability and price of Canadian gas is entirely a political matter. Given a history of substantial delays it is unlikely that imports of 250 to 500 billion cubic feet per annum could be added to Canadian supplies on short notice.

[7] The gas model described above and used to generate the forecasts in Table One takes advantage of data and forecasting models collected and used by the Department of Energy. The most relevant sources are:

Production of Onshore Lower-48. Oil and Gas Model Methodology and Data Description. DOE/EIA-0345, June 1982, Office of Oil and Gas.
Natural Gas Monthly. DOE/EIA-0130.
Monthly Energy Review. DOE/EIA-0035

TABLE ONE

CHANGES IN PRICE AFTER ONE YEAR ASSUMING MODERATE OIL PRICE INCREASES

	NGPA	Deregulation
	(percentage change)	
Moderate GNP Growth*	1.19	0.82
Low GNP Growth	1.35	0.98

NOTE:

Under high oil price conditions and moderate GNP growth price changes would be 1.02 percent and 0.64 percent, respectively, for the NGPA and Deregulation cases. Under low oil price conditions price changes would be 1.34 percent and 1.05 percent, respectively.

Because of the surplus of cheap gas high oil prices and high GNP growth will lower average prices by allowing pipelines to purchase more inexpensive gas already under contract.

*Assumptions for GNP growth:

High:	4-5% per year
Moderate:	3-4% per year
Low:	2% per year

Assumptions for oil price changes:

High:	+5% per year
Moderate:	0% per year
Low:	-4% per year

The inflation rate assumed is eight percent per year.

SOURCE: Model simulations based on parameter values shown in the footnotes. All estimates are percentage changes in real or constant dollar wholesale average national price.

TABLE TWO

CHANGES IN PRICE AFTER THREE YEARS ASSUMING MODERATE OIL PRICE PROJECTIONS

	NGPA	Deregulation
	(percentage change)	
High GNP Growth	47.24*	33.36
Moderate GNP Growth	34.12	21.50
Low GNP Growth	11.23	0.46

*Under the NGPA, high GNP growth and high or moderate oil price growth will result in a natural gas shortage of .2 to .5 trillion cubic feet at the end of 1984. This shortage is cleared from the market in 1985 as a consequence of the partial decontrol scheduled under the Act.

NOTE:

Under high oil price conditions and moderate GNP growth price changes would be 45.83 percent and 32.47 percent, respectively, for the NGPA and Deregulation cases. Under low oil price conditions price changes would be 24.23 percent and 12.91 percent, respectively.

SOURCE: Model simulations based on parameter values shown in the footnotes. All estimates are percentage changes in real or constant dollar wholesale average national price.

TABLE THREE

CHANGES IN PRICE AFTER FIVE YEARS

	NGPA	Deregulation
	(percentage change)	
High Oil Price		
High GNP	129.59	120.53
Moderate GNP	103.94	95.89
Low GNP	78.37	67.94
Moderate Oil Price		
High GNP	116.25	107.07
Moderate GNP	92.54	82.93
Low GNP	65.01	54.47
Low Oil Price		
High GNP	106.81	96.90
Moderate GNP	83.17	73.02
Low GNP	54.10	43.55

SOURCE: Model simulations based on parameter values shown in the footnotes. All estimates are percentage changes in real or constant dollar wholesale average national price.

show the longer term effects of the NGPA, for several growth and oil price assumptions.

The alternative case is one in which all natural gas prices are deregulated and allowed to go to market clearing levels. It is assumed that contract clauses such as "favoured nations" clauses do not cause prices to rise above market clearing levels, and that "take or pay" clauses do not prevent the price of high cost gas supplies from falling. This is not the same as the Reagan plan, under which only new contracts and renegotiated contracts are deregulated, so that only a small share of natural gas production will initially be at the market clearing price.[8]

The price increase after the first year of deregulation is from 0.5 percent to 1.0 percent, somewhat less than that expected without deregulation. Because of the gas surplus it is particularly hard to forecast this first year price increase. It is assumed that the surplus is not worked off, but new contracts are still signed for $2.72 per mcf. But if all of the surplus gas was used, the price of new gas contracts would fall below $2.72 per mcf, to a level in keeping with the marginal costs for much of the new volumes available. That level of new contract price would likely be close to $2.00 per mcf, which implies the average

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For a more complete description of the lagged adjustment process used in the demand and drilling equations, see Paul MacAvoy, Crude Oil Prices as Determined by OPEC and Market Fundamentals (Cambridge, Mass.: Ballinger Publishing Company, 1982), page 26.

Historical levels of drilling and drilling costs were obtained from the American Gas Association publications.

[8] The "price cap" imposed by the Reagan plan will prevent the upward ratcheting of prices under favoured nations clauses. This however is a second best solution. Renegotiating such contracts would be more efficient and would exert more downward pressure on price the setting a price ceiling. The "price cap only effects prices for cheap gas and does nothing to help bring down prices of deep and imported gas.

price decrease of 20 percent. This is the lower bound of the likely price effect of deregulation, and results from complete recontracting.

In following years, as described in Tables Two and Three, deregulation consistently keeps prices below those from the NGPA. The three year forecast under moderate conditions puts natural gas prices 13 percent lower given immediate deregulation. Under high growth conditions, the deregulated price level is again 13 percent lower and that is achieved without the deliverability shortage in 1984 caused by the NGPA. In the five year forecast, the prices under deregulation are still lower but the relative magnitude of the difference is less severe as in the intervening years. Under moderate growth and oil price conditions NGPA prices will grow to 92.5 versus price increases of 82.9 percent under deregulation, a difference of ten percent, less than the difference after only three years.

The Reagan Plan will achieve the same long run results as deregulation, but will fall short of immediate decontrol price savings in the short run. Since the Administration plan immediately deregulates only "new" and renegotiated gas, a small fraction of the total supply, it is unlikely that competitive pressures will bring gas prices down as rapidly as decontrol. Some old gas will remain at low NGPA price ceilings until 1985 or 1986, but the "price cap" set by the Reagan Plan will be higher than the equivalent deregulated price level.[9] The Administration Plan would achieve the same price gains and efficiency improvements as complete deregulation, after four or five years when all gas is decontrolled.

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[9] The price cap is the average of the deregulated prices, however with less deregulated gas there is less price competition to provide lower prices.

Senator JEPSEN. Mr. Twilley, going from right to left, you're next. You're in the middle.

STATEMENT OF JOSHUA M. TWILLEY, MEMBER, NATIONAL ASSOCIATION OF REGULATORY UTILITY COMMISSIONERS

Mr. TWILLEY. Thank you, Mr. Chairman and thank you for the opportunity to appear here. It's my first experience before a congressional committee and it's quite exciting for me.

I come here today as a footsoldier in the front line of regulation. I am a commissioner. I am a commissioner from a State which does not have any gas wells. We have distribution companies. I speak on behalf of the National Association of Regulatory Utility Commissioners, of which I am a member. I was also chairman of the committee that drafted the bill which is now S. 823.

Senator JEPSEN. For the record, what State are you from?

Mr. TWILLEY. Delaware, the first State in the Union.

Senator JEPSEN. Good.

Mr. TWILLEY. Last November, the National Association of Regulatory Utility Commissioners became very alarmed, as they had been for some time, in regard to what was happening under the Natural Gas Policy Act. And it seemed appropriate that as a group, we should try to offer some assistance to Congress in finding solutions. And it was at that time that a staff subcommittee of NARUC, composed of State commission staff personnel throughout the United States in most States, from California to New York, I might add, met to begin work on a proposal. There were a number of meetings, not only with the staff subcommittees, but also with commissioners representing all sections of the country. And it eventually resulted in this bill. It is a consensus bill. Many of us individually would have preferred a stronger bill, perhaps, or a weaker bill. But regulatory commissioners are very practical people. We are the ones—and I might add, it made my heart warm to hear Congressman Lungren refer to the constituents and how you explain to them when they come before you opposing increases in gas rates and telling you that they can't find afford to pay for the gas in their home—there is this problem that we must face the consumers directly and explain why the purchased gas adjustment clauses have to be raised.

It is true that we commissioners also felt very frustrated and helpless in this area because it was a congressional responsibility to pass laws dealing with this issue.

And so that is why we entered into this and developed this kind of bill. And its based upon the premise that the Natural Gas Policy Act should not be scuttled, but rather, should be amended to make it workable.

And that is because many of us recall a few years ago when we were dealing with curtailment problems, when increasing the available supply of gas was very important. I can recall, as a matter of fact, in my own State industrial companies coming before us to urge us not to let anyone else come on the system because we had about a 7-year projected future supply of gas and that was not even enough for them to go into the capital expenditure of putting in gas furnaces.

And so in that kind of climate, the Natural Gas Policy Act was enacted and it certainly did make a big change in the supply situation of gas. And I suppose that if we had continued in inflation, we probably wouldn't have had the problems that we have today. But who knows?

In any event, the aspects of this bill which continue the old-gas subsidy and regulation of old gas have value in our opinion, in that it will continue to promote exploration and it will permit higher cost gas, if it's reasonably priced, to be brought into our projected supply. It is, of course, based upon the original regulatory premise that prices should be cost based, and that the owners of that old gas are receiving an adequate return based upon their cost.

So they are not being hurt by continuing the old-gas regulation. I would suspect that many Congressmen may have had the problem of explaining back home why we should permit deregulation of old gas and permit the price increases to take effect when they, the residents who were buying the gas, would, in fact, be paying for larger profits for some producers that had no cost-based justification, only market-based justification.

And I think in this whole picture, we cannot lose sight of the fact that gas is not like fuel oil. You cannot shift back and forth. It doesn't have a lot of different uses. And one of its main uses, probably about 50 percent, is the residential user in his home-heating plants. And those people are not able to make the kinds of changes that industry can make, nor do they have the options open that other industries have.

So we address in S. 823 the question of a national consensus for something that would be practical, workable, would be nationally acceptable, in States that have no wells, but also in States that might have other interests in this area.

So the first step, of course, and I think there's not been any disagreement here, is the contracts problems that ought to be correct. And we felt that you shouldn't throw the baby out with the bath, but just get some clean water in there. And if take-or-pay contracts and indefinite escalators and these kinds of provisions were brought into control, then the correction would be made and things could be improved.

And we also felt that FERC had been interpreting its authority under the Natural Gas Policy Act too narrowly and that the definition of abuse and fraud under the act should be improved so that the commission would exercise more authority in this direction.

Other things to make the law more acceptable, such as the requirement that these contracts all be made public, were viewed as important by State regulators. And I would like to add in regard to that, in developing the position that the national association has in this, we consulted with liberal groups, as well as conservative ones, and with the AGA, as well as the AGD, as well with the Citizens/Labor Energy Coalition people, and there were members from Kansas on our subcommittee, and there were all walks of life. And it was our judgment that if we could come up with this kind of practical solution that addressed the contract problems, making FERC itself more active in its oversight of the pass through requests of pipeline companies, and providing other alternatives that would help with the local distribution company problems, that we would be overcoming and providing a kind of correction to the Natural Gas Policy Act that would enable it to continue as existing law.

And it does lead eventually toward total deregulation, but it moves slowly and permits Congress, from time to time, as it is now, to take another look to see if there should be corrections in this process.

And I'm impressed by an article that I happened to note recently in the New York Times by James Schlesinger, who said that, basically, the situation in this area is such that the gas distribution companies and the pipelines are not really equipped to move into total deregulation and that we should permit a slower movement in this direction, as the Natural Gas Policy Act would contemplate, this being a more appropriate direction to take.

My prepared statement goes into greater detail, but I thought I should give some independent views here. Thank you.

[The prepared statement of Mr. Twilley follows:]

PREPARED STATEMENT OF JOSHUA M. TWILLEY

Mr. Chairman and Distinguished Members of the Committee:

I. Introduction

Good morning. My name is Joshua M. Twilley, and I am a Commissioner of the Delaware Public Service Commission, a position I have held since 1975. I am testifying today on behalf of the National Association of Regulatory Utility Commissioners, commonly referred to as the NARUC. Accompanying me today are Paul Rodgers, NARUC Administrative Director and General Counsel; Rita A. Barmann, NARUC Director of Congressional Relations; and Linda L. Kent, NARUC Assistant Director of Congressional Relations.

The NARUC is a quasi-governmental, nonprofit organization founded in 1889. Within our membership are the governmental agencies of the fifty States, the District of Columbia, Puerto Rico and the Virgin Islands which are engaged in the regulation of utilities and carriers. Our chief objective is to serve the public interest by seeking to improve the quality and effectiveness of government regulation in America.

The members of the NARUC appreciate this opportunity you have afforded me today to make known their views on the economics of natural gas deregulation. As you know, all but one of the State public utility commissions,1/ or State PUCs, are charged with the responsibility for regulating retail natural gas sales to residential, commercial and industrial ratepayers. Federal natural gas pricing is of vital concern to State regulators, since the major cost components of retail gas rates--i.e., wellhead prices charged by producers and wholesale or "city-gate" rates charged by pipeline companies--are controlled only at the Federal level.

1/ The State of Nebraska does not regulate electric or gas utilities, all of which are owned or regulated by public power districts and municipal governments within its borders.

In 1978, Congress determined that it is in the public interest to reduce Federal regulation of gas wellhead prices. We are now less than two years away from the partial deregulation date that was thus established in the Natural Gas Policy Act of 1978 (NGPA).[2] We are also now engaged in an intensive national policy debate concerning the extent to which NGPA revisions are needed to ensure that natural gas prices do not exceed competitive levels. Legislative proposals offered for this common purpose literally run the gamut: from total removal of wellhead price controls, to delay of the 1985 partial decontrol date for two or more years, with various other remedies in between.

It is clear, then, that the subject of the Committee's hearing today could hardly be more timely, and on behalf of the State regulatory community, I would like to commend you for placing the impact of our Nation's current and future natural gas policies among your top study priorities.

For our part, members of the NARUC have endeavored to reach a consensus among State regulators as to the nature of our current gas pricing problems and the most desirable means to resolve them. Last November, I was appointed by the Association's Committee on Gas, of which I serve as Vice Chairman, to head a special task force on Federal legislation addressing natural gas policy. Our task force developed draft legislation proposing a range of NGPA amendments, many of which are also included in various bills now pending in the House and Senate. Our draft legislation, the proposed Natural Gas Fair Marketing Act of 1983, was subsequently adopted by the NARUC's Gas Committee and the Association's policy-making arm, the Executive Committee.

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[2] 15 U.S.C. §§ 3301 *et seq*.

The NARUC-endorsed legislation has since been introduced in the House (H.R. 2164), and in the Senate by the distinguished Chairman of this Committee (S. 823). Though some of us individually might advocate additional or different NGPA revisions, we think it highly significant that so many of us, with our widely varying perspectives on gas policy, have been able to agree on the need for legislation of a relatively far-reaching nature.

This morning I would like to describe for the Committee the underlying problems which have led us to this consensus position regarding appropriate legislative remedies. From our perspective, these problems can be generally characterized as follows:

- First, there is inadequate Federal oversight of the gas purchasing practices of interstate pipelines companies;
- Second, pipeline-producer contracting practices are largely insulating the producing segment of the gas industry from market forces;
- Third, local distribution companies typically have no competitive alternative from which to purchase gas supplies; and
- Finally, certain Federal policies have been established that thwart, rather than facilitate, effective State regulation of retail gas rates.

II. Pipeline Unaccountability

In retrospect, it seems clear to us that one of Congress' major miscalculations in crafting the NGPA was its failure to specify that interstate pipelines must be held responsible for their gas purchasing decisions. Section 601 of the law requires that such pipelines' purchased gas costs be passed through automatically to the pipeline's wholesale customers, except where there has been "fraud, abuse or similar grounds".[3] The Federal

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[3] 15 U.S.C. § 3431(c).

Energy Regulatory Commission (FERC) has interpreted the latter exception quite narrowly,[4/] such that "imprudent" pipeline purchases of high priced gas when lower-cost supplies are available are nevertheless granted automatic passthrough treatment.

The adverse impact of dubious gas purchasing decisions is not averted by such superficial regulatory review; it is merely shifted to the pipeline's customers, most of whom are the local gas utilities we regulate. Both State commissions and utilities have been active participants in recent FERC proceedings to consider interstate pipelines' purchased gas adjustment (PGA) requests. However, unless the statutory standard of review is broadened--by legislative action or by FERC reinterpretation--even the most insightful input in these proceedings will be of limited effectiveness.

It should be noted that the groundwork for just such a reinterpretation on the FERC's part has already been laid. In a December 30, 1982 decision issued by FERC Administrative Law Judge Michel Levant,[5/] Columbia Gas Transmission Corp. was denied the right to pass through certain of its purchased gas costs under Section 601, in part on the basis that the pipeline has engaged in an "abusive" practice of cutting back on low-cost gas supplies under take-or-pay contracts before reducing purchases of higher cost supplies. Judge Levant also found that Columbia's practices in projecting future supply requirements and acquiring gas supplies were "unjust, unreasonable, unduly discriminatory and preferential" within the meaning of Section 5 of the Natural Gas

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[4/] See the FERC's policy statement on this matter, published at 47 Fed.Reg. 6253-63 (February 11, 1982).

[5/] Docket Nos. TA81-1-21-000 and TA81-2-21-000.

Act (NGA),[6] and he ordered the pipeline to modify such practices and to renegotiate inflexible contractual provisions to the maximum extent feasible.

Judge Levant's decision reflects the effort to harmonize the FERC's authority under NGPA Section 601(c) and NGA Sections 4 and 5 which FERC Commissioner J. David Hughes argued several months earlier the Commission has thus far not met head on. As Commissioner Hughes noted in his partial dissent from a Commission order in a Tennessee Gas Pipeline Co. PGA case,[7] under the NGA interstate pipelines are granted significant market power but are also vested with responsibility to consider the economic consequences for their captive customers of exercising this power. He also points out that "abuse" under Section 601(c) may be the disregard of a duty or the improper use of a right or privilege.

Even assuming that the full Commission chooses to break new ground and affirm Judge Levant's decision, the NARUC believes that Congress should explicitly codify a stricter standard of FERC review for pipeline purchasing practices. The experience of the last two years in particular shows that essential consumer protections should not be left to Federal agency discretion.

III. Market-Insensitive Provisions In Producer-Pipeline Contracts

Virtually all parties to the natural gas policy debate agree that inflexible, long-term contracts between producers and pipelines have been a major contributing factor to gas price increases over the last two years. The existence and broad scope of the "contracts problem", as it has come to be called, are well-documented,[8] and I will discuss it only briefly for this reason. Take-or-pay, indefinite price escalator, and most-favored-nation clauses in such contracts provide producers an assured revenue stream, even when the wellhead prices these revenues are based upon exceed the actual market value of the purchased gas. This problem is exacerbated by the absence of renegotiation or "market-out" clauses in many producer-pipeline contracts.

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[6] 15 U.S.C. § 717d(a).

[7] Docket Nos. TA82-2-9-000, RP81-54-000, RP82-12-001, and TA82-1-9-001. The FERC's Order Denying Rehearing was issued on October 1, 1982.

In our view, it makes no economic sense to permit the operation of contract provisions which insulate the producing end of the natural gas industry from the effects of overpricing gas. This is particularly so given the fact that the proportion of consumer-derived revenues which goes to gas producers has doubled during the last 11 years.[9]

There is an obvious link, of course, between FERC's regulatory treatment of pipelines' gas acquisition costs and producer-pipeline contractual arrangements. As long as a pipeline company's management knows it will not be held accountable for its gas purchase decisions, there exists no incentive to avoid onerous terms in contracts with producers. The recent news that Columbia Gas plans to reduce certain of its "take" obligations to 50 percent of contracted levels in an effort to hold down gas prices[10] is

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8/ See generally, e.g., Comptroller General of the United States, Information on Contracts Between Natural Gas Producers and Pipeline Companies (February 22, 1983); Energy Information Administration, U.S. Department of Energy, An Analysis of Post-NGPA Interstate Pipeline Wellhead Purchases (September 1982); and Congressional Research Service and National Regulatory Research Institute, Natural Gas Regulation Study (July 1982).

9/ U.S. GAO, Natural Gas Price Increases: A Preliminary Analysis (December 9, 1982) at 6.

10/ Reported in The Washington Post, April 6, 1983.

arguably a direct result of the previously mentioned PGA decision by ALJ Levant.

But consumers nationwide need relief from rising gas prices now. The NARUC therefore supports congressional action to outlaw contractual indefinite price escalators, to modify take-or-pay obligations in existing contracts, and to include "market-out clauses" in current contracts.

IV. Distribution Companies' Lack of Competitive Supply Options

Currently, most local gas distribution companies have no choice but to rely upon only one pipeline for their supply requirements. In much the same way, many producers complain of gas wells being shut in because the only pipeline in the vicinity is unwilling to buy their production. Pipelines are thus accurately described as possessing both monopsony and monopoly power within the natural gas industry.

The NARUC believes that the time has come to begin serious consideration of ways to restructure the role of pipelines in the industry in order to encourage competition in the gas supply market. A partial solution that has received some support from the FERC is greater pipeline freedom to engage in off-system sales of natural gas. Virtually all interstate pipelines have expressed support for this approach, especially since it would assist them in dealing with high take-or-pay requirements. Prepayments for natural gas under take-or-pay provisions are generally included by the FERC in an interstate pipeline's rate base, whether or not the gas can be sold. If the pipeline is able to sell the gas to off-system buyers, rate base treatment of the prepayment is avoided, and the pipeline's on-system customers benefit.[11]

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[11] See speech by FERC Commissioner J. David Hughes to the Federal Energy Bar Association, January 13, 1983, at 8-12.

The FERC recently approved a new off-system sales policy,[12] and it remains to be seen whether the number of such transactions, and the consequent level of supply competition, will increase as a result. Previous experience has been disappointing: of the 1,090 Bcf of off-system gas sales authorized by the Commission as of November 13, 1982, only about 227 Bcf have actually been sold.[13]

There are, of course, more radical approaches to revising the role that pipelines play in the gas industry. At least one State commission is actively supporting Federal legislation to impose common carrier status on all interstate pipelines.[14] A national coalition of producers and end-users[15] advocates extension of this to intrastate pipelines and distribution companies as well. Mandatory contract carriage of gas owned by parties other than the transporting pipeline is a variation on this theme. The thrust of such proposals--to enable producers and ultimate consumers to negotiate directly on gas sales--is quite attractive to many State regulators, since this would surely encourage market-sensitive producer pricing.

At this juncture, the NARUC believes that Congress should direct the FERC to study all of the ramifications which may be involved in restructuring existing relationships between distributors and pipelines. Unless the current situation is somehow changed, the lack of competition between gas suppliers will continue to cause unnecessarily high retail rates.

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[12] The new policy was approved at the Commission's March 10, 1983 meeting. A written order has not been issued as of yet.

[13] Speech by FERC Commissioner Hughes at 8.

[14] Statement of Philip R. O'Connor, Chairman, Illinois Commerce Commission, before the Senate Committee on Energy and Natural Resources, March 12, 1983.

[15] The coalition is called the Association for Equal Access to Natural Gas Markets and Supplies.

V. Federal Impediments to Effective State Retail Rate Regulation

Incremental Pricing. The final set of problems I would like to bring to your attention today concerns Federal policies that have unnecessarily impeded effective State regulation of retail gas rates. State regulators would place the NGPA's Title II,[16] containing mandatory incremental pricing provisions, among the prime examples of such impediments. The NARUC strongly opposed inclusion of these provisions in the NGPA when the law was under consideration in 1978, on the grounds that mandatory incremental pricing would result in higher rates to residential users due to consequent reduction of industrial gas use, and that it constituted an unwarranted first-time intrusion of Federal control into this aspect of retail ratemaking. We are convinced that the passage of time has only made these arguments more persuasive.

Title II of the NGPA provides that most large industrial boiler consumers of gas which purchase supplies, either directly or indirectly, from interstate pipelines are to be assigned the incremental cost of new gas. These industrial facilities are required to absorb this surcharge until their gas costs equal the cost of alternative fuel, which the FERC has designated as No. 6 oil.

Title II also places specific restrictions on the States' regulatory discretion with respect to the incremental pricing surcharge on industrial users. Under Section 205, State regulatory commissions are required to pass through directly to incrementally priced industrial users any surcharge paid by a local distribution company for gas purchased from interstate pipelines. In addition, the States are forbidden from modifying rates for incrementally priced industrial users so that the surcharge would be offset.

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[16] 15 U.S.C. §§ 3341-3348.

The troublesome nature of these restrictions on State regulatory authority is especially apparent under today's natural gas market conditions. Automatic imposition of the incremental surcharge on large industrial users makes them extremely sensitive to gas price increases. Their fuel-switching capacity already causes such users to place a lesser value on natural gas service; mandatory incremental pricing only exaggerates this tendency, making conversion to alternative fuels more attractive.

The impact of industrial load loss on a gas utility's remaining customers is direct and inevitable: it increases the fixed plant costs which must be shared by all ratepayers, thus causing residential and commercial retail gas rates to rise. According to the FERC's Office of Regulatory Analysis, sales by gas utilities to industrial customers during the last part of 1982 hit their lowest level in the last five years.17/ Incremental pricing as mandated by the NGPA unquestionably limits the States' ability to respond to this reality, and thereby protect the interests of all gas consumers.

Another flaw in the incremental pricing scheme relates to the fact that the surcharge is imposed without regard to whether the gas is contracted for on an interruptible basis. Industrial users are thus discouraged from entering into interruptible ser-

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17/ FERC Monitor, March 21, 1983, at 8.

vice contracts, since the economic attractiveness of such arrangements is greatly reduced or eliminated. Gas distribution companies benefit from having interruptible customers; for example, this allows them to meet peak demand during the heating season without adding storage capacity. Under Section 111 of the Public Utility Regulatory Policies Act of 1978,[18] electric utilities are required to encourage customers to accept interruptible service. Incremental pricing serves to impede this same goal in natural gas markets.

In sum, the members of the NARUC firmly believe that experience has shown incremental pricing to be a manifestly unwise Federal policy that interferes with the States' ability to ensure least-cost gas service to all consumers. We have therefore requested those congressional committees with legislative jurisdiction to include repeal of Title II in any natural gas bill that is reported.

Producer-pipeline contract filing. Turning to another Federal barrier to effective State regulation, we feel strongly that the FERC's failure to fully exercise its authority to require producer-pipeline contracts to be filed with the Commission, and to make material terms of those contracts publicly available, has made the States' task of evaluating the reasonableness of distribution company purchasing practices unnecessarily difficult. The NARUC believes that the Commission currently possesses ample statutory authority to implement such filing requirements.

Section 315(c)[19] of the NGPA permits the FERC to issue regulations requiring the filing of all such contracts and ancillary agreements. Moreover, Section 501(a)[20] grants the Commission general rulemaking authority to issue regulations "as it may find necessary or appropriate to carry out its functions under this chapter" of the NGPA.

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[18] 16 U.S.C. § 2621.

[19] 15 U.S.C. § 3375(c).

[20] 15 U.S.C. § 3411.

The NARUC has petitioned the FERC to implement producer-pipeline filing requirements, a request which the Commission has yet to act upon[21/]. Without the opportunity to examine these contracts, State commissions as well as the general public are precluded from knowing how the major cost component in a retail gas rate case is computed. As with the pipeline accountability issue I discussed earlier, we believe that although current law enables the FERC to take the desired action and thereby subject pipeline transactions to greater public and regulatory scrutiny, the Commission's unwillingness to exercise its authority in this regard demonstrates the need for a legislative remedy that compels the FERC to act.

Preferential treatment of natural gas pipeline tax credits. An additional concern shared by many State regulators involves the FERC's regulatory treatment of investment tax credits claimed by interstate natural gas pipelines. Under a provision of the Internal Revenue Code that was added in 1971,[22/] the FERC is permitted to set pipeline rates without regard to the tax forgiveness obtained by the pipeline through investment tax credits. The Commission has routinely been granting this preferential treatment since 1972, despite the fact that the statutory precondition for such treatment--that the company's gas supply is "insufficient to

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[21/] The NARUC petition for rulemaking was filed in FERC Docket No. RM-82-20. The Commission referenced the NARUC petition, *inter alia*, in its April 28, 1982 Notice of Inquiry on Impact of the NGPA on Natural Gas Markets (Docket No. RM82-26).

[22/] Section 46(f)(1)[26 U.S.C. § 46 (f)(1)].

meet the present and future requirements of the domestic economy"--is clearly no longer applicable.

The Iowa State Commerce Commission recently petitioned the FERC to revise its policy regarding treatment of pipeline tax credits[23]. In a supporting statement filed by the NARUC, it was pointed out that the FERC policy "clearly results in a substantial direct subsidy from ratepayers to [the pipeline's] stockholders, which in turn causes natural gas rates to exceed those which would be in effect if conventional normalization ratemaking treatment were employed . . .".[24] Seventeen States have also joined in support of the Iowa petition.

The seriousness of this problem is substantial because of the magnitude of the investment tax credits now being generated by pipelines. During the ten-year period between 1972-82, FERC Class A and B pipeline companies claimed nearly $1.5 billion in such tax credits. Over $840 million of this sum was generated in the past three years alone.[25]

At a time when natural gas retail rates are rising precipitously throughout the Nation, we can ill afford to grant pipelines a tax preference at the ultimate expense of gas utility ratepayers. Accordingly, the NARUC has endorsed legislation pending in the House (H.R. 570) which would repeal that Internal Revenue Code provision permitting this preferential treatment.

Federal-State Joint Board. In order to foster future Federal-State cooperation in natural gas regulatory matters, the NARUC believes that a Joint Board mechanism should be established at the FERC. Federal-State Joint Boards have been a useful feature of the telecommunications regulatory framework for many years, providing the States with the opportunity for active input into Federal Communications Commission deliberations which have a special impact on State concerns.[26] Similarly, a Joint Board on natural gas matters would allow the States a meaningful voice in recommended decisions of the FERC.

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[23] Docket No. RM83-8-000. The Iowa petition was filed on November 8, 1982.

[24] Statement of the NARUC In Support of Petition For Rulemaking, Docket No. 83-8-000 (December 14, 1982) at 4.

[25] Id. at 6.

We believe the rationale for establishing a Joint Board mechanism in the natural gas regulatory arena is a compelling one. As mentioned earlier, the largest cost components in burner-tip gas prices are controlled only at the Federal level. Our experience thus far in making the transition to partial deregulation of wellhead prices shows that State regulators are forced to deal with the consequences of a poorly fashioned transition in this regard but are precluded from making the regulatory decisions which are actually shaping it. The Commission's proposed and final rules concerning wellhead prices under Section 107 of the NPGA[27] are obvious examples of such decisions, but the list by no means stops there.

Use of Joint Boards would ensure that State regulators are permitted to do more than merely comment upon major regulatory proposals with respect to natural gas that are conceived by the FERC staff. Moreover, providing them with a more decisive role in the promulgation of Federal regulations is in keeping with State regulators' legal responsibility to see that retail gas rates are just and reasonable.

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[26] See 47 U.S.C. § 410(c).

[27] 15 U.S.C. § 3317.

VI. Conclusion

The problems I have touched upon this morning have contributed in varying degrees to a gas pricing situation that is in the interests of neither industry nor consumers. Today's prevailing prices for natural gas continue to increase even as demand is dropping and gas supplies are growing more abundant. In recent testimony before a House subcommittee, FERC Chairman C.M. "Mike" Butler III described an informal survey of gas distribution companies undertaken by FERC staff. This survey revealed that significant fuel-switching is occurring around the country as a result of gas prices which exceed market-clearing levels.[28]

State regulators can readily attest to the pervasiveness of this market loss problem. From our perspective as the officials whose obligation it is to maintain adequate revenues for the nation's gas utilities, we can also verify the existence of the very real dilemma which this problem creates: the only way to assure recovery of the utility's fixed plant costs when industrial markets shrink is to raise prices for its captive customers--the residential and commercial ratepayers--even more.

Most assuredly, the smooth transition to a deregulated gas market which the NGPA's authors intended the law to provide is not occurring. Demand-sensitive pricing of natural gas remains largely an unrealized dream. In our view, as Congress begins the complicated task of rethinking Federal gas policy, the central focus must be how best to achieve that dream, consistent with the public interest.

Thank you for your attention.

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[28] Statement of C.M. Butler III, Chairman, FERC, before the Subcommittee on Fossil and Synthetic Fuels of the House Committee on Energy and Commerce, February 10, 1983, at 3.

Senator **Jepsen.** We appreciate that and I thank you. Mr. Cooper, if Mr. MacAvoy is to keep his appointment, I think that, if we have questions for him, we should ask them now.

Would you understand and please permit us to do that?

Mr. **MacAvoy.** Senator, to be courteous to my colleagues, my appointment is a luncheon appointment with the Vice President. And given the present powers of the Vice Presidency, I believe it could wait 15 or 20 minutes longer. [Laughter.] So I would be perfectly pleased to stay.

Senator **Jepsen.** You may proceed, Mr. Cooper. Thank you.

STATEMENT OF MARK COOPER, DIRECTOR OF RESEARCH, CONSUMER ENERGY COUNCIL OF AMERICA

Mr. **Cooper.** I appreciate. Mr. MacAvoy's, what I take to be somewhat complimentary, remark. I'm not sure that I can be more incisive, but I will disagree. I've become used to going last and I though I would wait to see what Mr. Twilley would say. And, in fact, he said a few things that I can agree with. Indeed, my hopes were met beyond imagination when he mentioned cost-based pricing, which is a very difficult thing to say in this town these days.

In my prepared statement, I've tried to create a balance, to meet the spirit of the committee's request to deal with the issue in an analytic framework, by blending about 50-percent conceptual statements, 25-percent empirical judgments, and 25-percent political judgments. But given what's gone before, I think I should stress those aspects of my comments that reflect my political judgment, since those are not frequently heard.

There are really two basic issues before Congress, this committee, and the Nation. First, what should be done with the economic rents of natural gas production? Second, is there significant potential for noncompetitive profits in the industry? In the current context, that focuses a great deal of attention on the causes of the aberrant contract provisions that we find throughout the industry.

In my prepared statement, I distinguish two basic views of the market, which, to try and depoliticize things, I call market hopefuls and market protectors. The hopeful view believes that free competition applied to American geology will yield a larger response of supply to price increases, especially in old fields, than the available evidence would suggest. In this view, the consumer would be protected by competition. Regulation distorts the supply curve in a number of ways. It holds down low-cost-gas supply. It creates inequities in the endowments of low-cost supplies that create the possibility for the misallocation of resources to high-delete cost suppliers. And it creates nonprice bidding practices that dampen the responsiveness of supply and price to demand changes. I think I've fairly represented both the administration's position and Mr. MacAvoy's comments.

The market protectors have a different view of things. They see three first-order problems and one second-order problem.

First, an inelastic supply curve creates the potential for large economic rents.

Second, noncompetitive conditions between the wellhead and the city gate create the potential for oligopoly problems. These noncompetitive conditions include factors such as limited access to the field—and these limitations are not imposed by regulation, but by real economic barriers—automatic passthrough clauses, affiliations and joint production arrangements.

Third, captive consumers at the burner tip creates a potential for even larger oligopoly or even monopoly profits.

With that view, market protectors believe that it is imperative for Government to intervene to protect consumers because competition is inadequate and wealth transfers are excessive. And analytically, they seek a regulatory response that can capture economic rents and prevent the extraction of monopoly or oligopoly profits without destroying the response of supply to price.

It is the preservation of that supply response that is the second order of problem, which arises from the regulatory approach to the first three problems. Mr. MacAvoy is right. There is an assumption of prescience, the ability to look at the market and not distort it.

In theory, there is a set of regulatory categories that could simulate closely the supply curve. Economic rents could be captured, while supply responses could be elicited. That was the objective of the Natural Gas Policy Act. The large number of categories that everyone complains about these days is nothing more or less than a rational attempt to move the regulatory scheme closer to the supply curve.

In practice, in spite of the mauling that the regulatory theory took in the tortuous process of creating the Natural Gas Policy Act, and in spite of the mauling that the Natural Gas Policy Act has taken at the hands of the Federal Energy Regulatory Commission in implementing it, it seems clear that some of the rents have been passed through to consumers and some have been captured by producers of high-cost gas, while supply has, in fact, been stimulated.

It is absolutely critical to recognize that where you think we are and where you want to go are separate considerations. You can believe that we are in a situation of perverse regulation and want to move to improved regulations. Or you can believe that we are in a position of imperfect regulation and want to move to complete deregulation.

Where you think we are is an impirical question. Where you think we should go is a morale, normative, and ultimately political. question. It is also obvious that how you think we got here will affect where you want to go and how you think we can get there.

But there is a second point that is important. From the market protector point of view, it is important to recognize the equity implications of the economic reality of the fossil fuels market. The essence of political choice in the pricing of a commodity such as natural gas is the recognition that both supply and demand elasticities are low. Therefore, the equity-efficiency tradeoff is very difficult. Even if one does not assume oligopoly and monopoly, economic rents can be so large and supply-demand responses to price so small, that equity losses—that is, the transfer of wealth or surplus from consumers to producers—may far outweigh efficiency gains, that is, the increase in the national economic pie as a result of deregulation.

It is critical to recognize the possibility that the pie can get bigger, but the redistribution of benefits may be so radical that there are large groups, even a significant majority, that would end up with a smaller piece. Distribution matters in philosophy, in practice, and in politics.

I believe that the evidence produced by the Department of Energy, the Energy Information Administration, and the Government Accounting Office shows quite clearly for both natural gas and petroleum that the low supply-demand elasticities create this very, very difficult equity-efficiency tradeoff.

I am not a liberal who mistakes and overlooks efficiency. I just believe that in the energy area the tradeoff is difficult and the sums at stake are very large.

Given this conceptualization of the market, the Congress must read the empirical record and decide between two competing interpretations. And I rephrase the questions that you have asked in holding these hearings. Does the recent loss of industrial load by natural gas distributors reflect the temporary aberration of contracts or structural forces which would indicate that natural gas producers will not compete in, nor will they attempt to clear, the No. 6 fuel oil market?

If the latter, is that failure to compete simply a rationalization of commodity values, what has been referred to in earlier testimony as opportunity value or market value, or is it an exercise of oligopoly power?

The second major question—what is indicated by the fact that contracts were rewritten with incredible speed in the tight market of the late 1970's to include all those aberrant contract clauses we hear so much about but the very slack markets of the early 1980's have done nothing at all to alter those clauses. In spite of what the administration says about renegotiations, the responses to the questions posed by Congressman Sharp on the House side clearly show that contract renegotiations have gone nowhere.

Does this one-way street—up but not down, contract clauses that push prices up, but never down, market pressures that put them in but never remove those clauses—does this reflect perverse incentives upon the Natural Gas Policy Act enshrined in inviolable contract? Or does the fact that contracts are inviolable in some circumstances but not others indicate the underlying distribution of market power is structurally skewed to the advantage and in favor of producers at the expense of pipelines and consumers?

These are difficult questions to resolve empirically and they would merit years of study. But as the chairman pointed out, politics and price increases demand decisions faster than that. We must read the record that we have as best we can.

I obviously believe that the record strongly suggests pervasive market imperfections that mandate consumer protection and regulatory relief. The supply and demand curves that I have used in my prepared statement are empirically based, having been derived, as I pointed out, from the Department of Energy study, and I believe that they are quite consistent with the ongoing work of the EIA.

The policy conclusions at which I arrive are quite different than those you have heard earlier. I believe that in order to capture about half of the economic rents that are likely to be available in the natural gas market through the end of this decade, we must not decontrol old gas.

Indefinite price escalators and most-favored-nation clauses which refer to other prices must be abolished. This cross-referencing of prices violates the very essence of competition at the wellhead and the burner tip.

Take-or-pay clauses must be set at levels necessary to do what they were intended to do—provide stable finance for the industry. They must not be allowed to be used to bid for gas or insure producers very high profits.

Automatic passthroughs must be permanently eliminated to remove the insulation of pipelines from the consequences of their bidding practices.

The discretionary powers that FERC has used to raise prices and the failure of FERC to police the industry by its interpretation of fraud and abuse must not be permitted. We must go back to the just and reasonable, or even stronger language, to guide pipeline behavior.

I like to call this a least-favored-nation clause, for any pipeline that is not buying gas at the lowest price that FERC has before it, should be forced to explain why it was unable to find the least cost supply.

From this point of view, it is important to stress that a simple market solution, and certainly the one that is presented by the administration, does not provide consumer protection. But it is even more important to point out that it is not an economically efficient solution. The transfer of economic rents to and the extraction of noncompetitive profits by the producers will simply drain resources away from other sectors of the economy that are in need of capital and consumer spending. It will create a natural gas price drag on the economy at the moment that the oil price drag of the second energy price shock is finally working its way out.

Above all, if we give up any notion of setting prices for natural gas by cost and accept the notion of market value or opportunity value, we will tie natural gas prices irrevocably to the political manipulated price of oil. And that is to give up all hope of allocating our economic and energy resources in a manner that is consistent with the economic forces, values, and needs of our domestic economy.

Therefore, we believe that it is necessary to design an institutional regulatory structure that insures that gas prices will be driven by the competitively determined cost of production, not by the opportunity or market force of a politically dictated price of oil.

Thank you and I'll be glad to answer any questions.

[The prepared statement of Mr. Cooper, together with attachments, follows:]

PREPARED STATEMENT OF MARK COOPER

Mr. Chairman and Members of the Committee:

My name is Dr. Mark Cooper. I am Director of Research at the Consumer Energy Council of America (CECA). CECA is a broad based coalition of major national consumer, labor, farm, public power, rural electric cooperative, senior citizen, urban and low income organizations (see attached list).

I enthusiastically applaud the Committee for tackling the difficult subject of natural gas pricing in a framework that asks for analytic reflection on the differences of opinion about why the natural gas market is not functioning well and how it might be improved. As one who spends a significant amount of time dealing with politics, I appreciate the opportunity to reflect. In my remarks I will try to meet the spirit of the Committee's request to deal with the issue in an analytic framework by creating a blend of 50 percent conceptual statements, 25 percent empirical assessment and 25 percent political judgments.

Basic Views of the Natural Gas Market

There are two basic issues before this Committee and the Congress: 1) What should be done with the rents of natural gas production? 2) Is there significant potential for non-competitive profits in the industry, which, in the current context, focuses a great deal of attention on the causes of the aberrant contract provisions that we find throughout the natural gas industry? Each of the proposals before the Congress and the nation takes a specific position on each of these issues.

Of course, the analysis that the proponents of the various proposals conduct is much more complex than the simple questions suggest. What I propose to do is to capture and reconcile each aspect of the various proposals by ascertaining what they are saying about the nature of supply and demand for natural gas in this country. For those who can stand to look at supply and demand curves, I have provided a set of graphs which depict each step in my argument, although I hope my argument is comprehensible without reference to the curves.

To defuse the political nature of the debate, I will depict the current difference of opinion as a difference between those I call Market Hopefuls (MHs) and those I call Market Protectors (MPs).

[As depicted in Figure 1] Market Hopefuls believe that the currently observable supply curve for natural gas is distorted. It has been rendered artificially inelastic by partial regulation which gives strong incentives to produce high cost gas and to withhold lower cost gas from the market in anticipation of decontrol. MHs believe that, given the chance, the market would be extremely competitive and that free competition applied to American geology would produce a more elastic supply curve, although it would still be relatively inelastic. That is, even with their hopeful view, they assume that an increase in price of 1 percent would lead to increases in supply of considerably less than 1 percent.

[As depicted in Figure 2] Market Protectors do not see such a rosy supply curve. Not only do they not see a much more

FIGURE 1

MARKET PROTECTOR'S VIEW OF THE NATURAL GAS MARKET

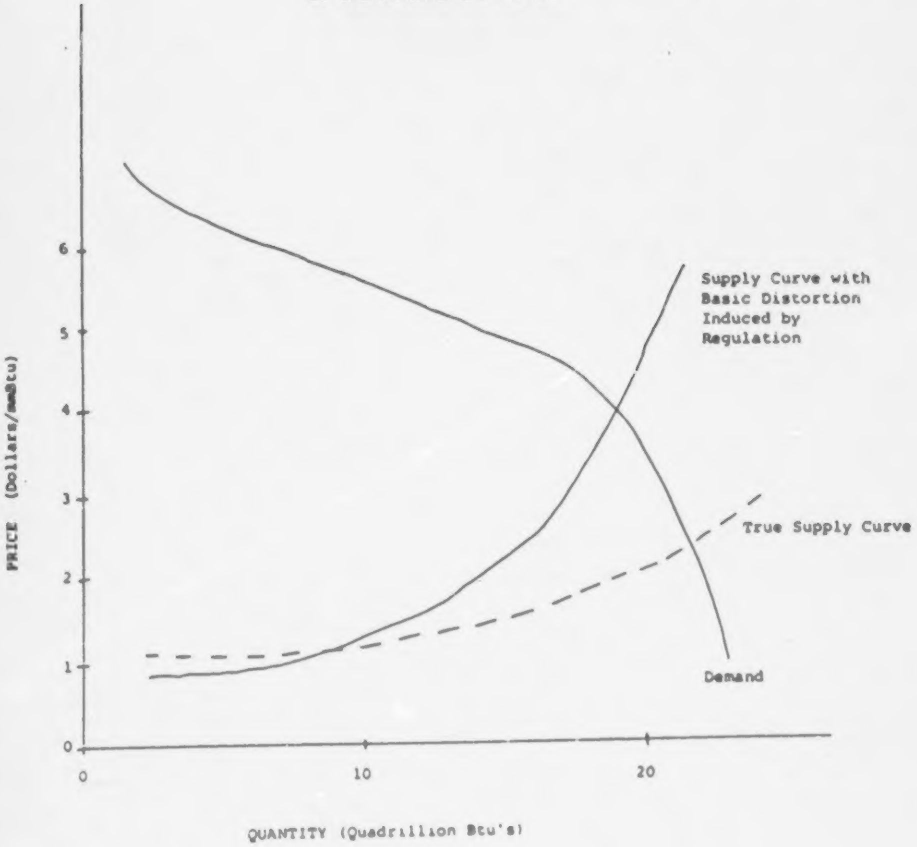
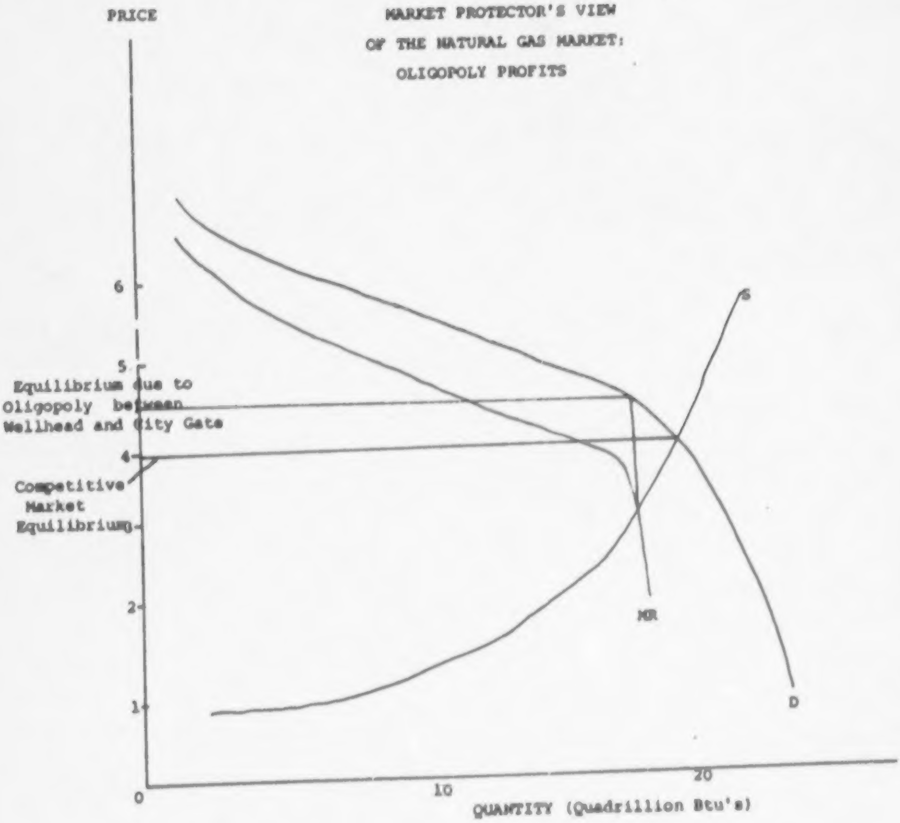


FIGURE 2

MARKET PROTECTOR'S VIEW
OF THE NATURAL GAS MARKET:
OLIGOPOLY PROFITS



elastic supply curve in the cards, but they believe that there are non-competitive aspects of the market which would drive the price in a decontrolled market above the level it would settle at if competition were perfect. They believe that a maldistribution of bargaining power, various arrangements between producers and pipelines (affiliations, joint production arrangements) and simple monopoly or oligopoly circumstances reduce competitive forces between the wellhead and city gate (the point at which gas is transferred to distribution companies). This would drive the price above the competitive equilibrium toward an oligopoly level. Moreover [as depicted in Figure 3], the presence of a significant captive market -- a market with either no real alternatives or very large costs of conversion to alternatives -- shifts demand upward, leading to an even higher price.

Basic Views of Regulation

[As depicted in Figure 4] the Market Protectors see a need for regulatory relief because an inelastic supply curve creates large potential economic rents, in addition to the possibility of oligopoly and/or monopoly profits. They would like to capture the former for consumers while preventing the latter. They would like to do so without distorting the supply curve. In theory, there is a set of regulatory categories that could simulate closely the supply curve. That was the objective of the Natural Gas Policy Act (NGPA). The large number of categories that everyone complains about is nothing more or less than a rational attempt to move the regulatory scheme closer to

FIGURE 3

MARKET PROTECTOR'S VIEW
OF THE NATURAL GAS MARKET:
CAPTIVE MARKETS

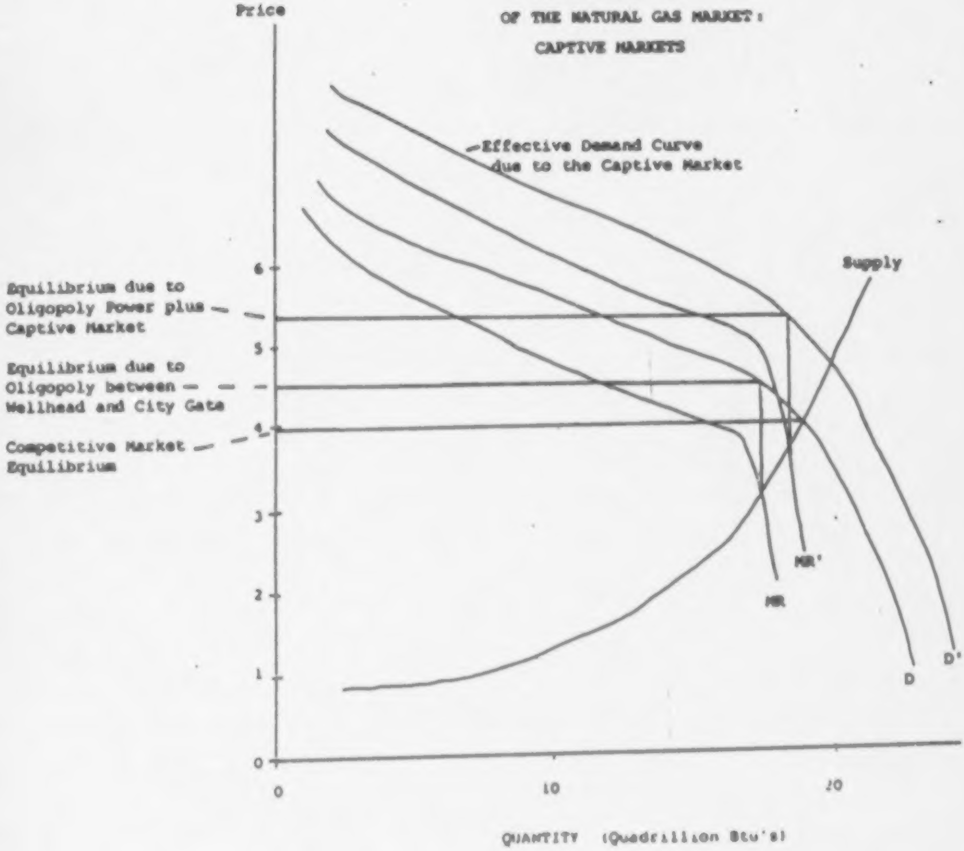
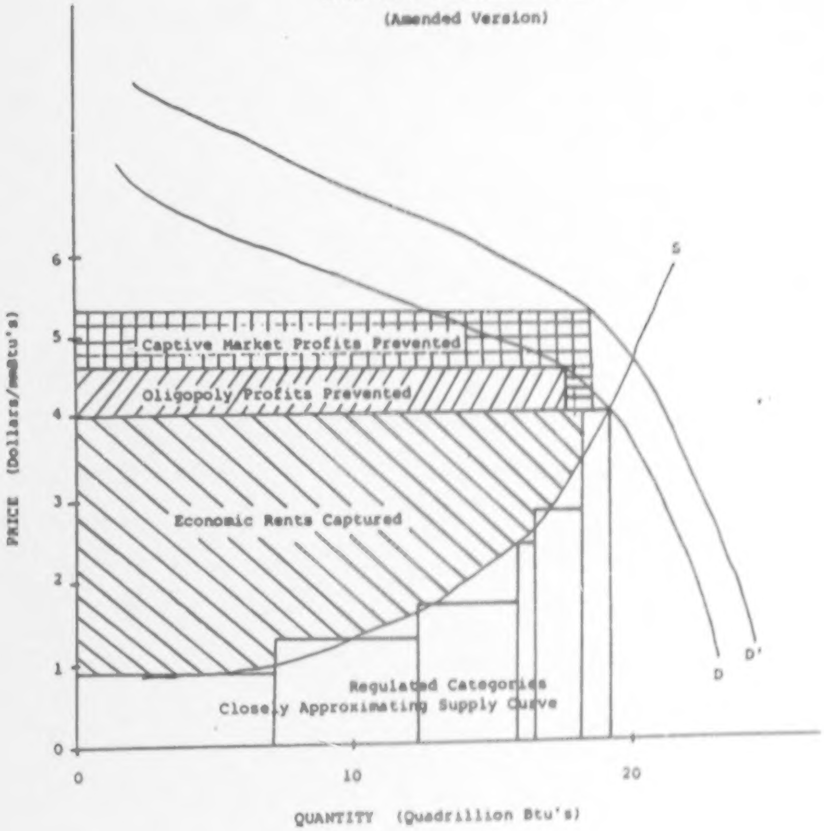


FIGURE 4

MARKET PROTECTOR'S VIEW
OF AN IDEAL REGULATORY SCHEME
(Amended Version)



the supply curve.

Is it possible to shoot for such a regulatory scheme? As convoluted as NGPA is and as badly as it has been implemented by FERC, it has, in fact, achieved some of its goals. A Government Accounting Office (GAO) report on NGPA concluded that: "In fact, throughout the period [1983-1990], 'NGPA' results in slightly lower prices and higher production than in the 'Price Decontrol in 1983' case." The Department of Energy reached a similar conclusion. It is fairly certain that the conclusions these reports project for the 1983-1990 period are exactly how NGPA has operated since its passage. Some of the rents have been passed through to consumers and some captured by producers and/or pipelines. As the Energy Information Administration (EIA) has concluded, "Binding price ceilings and average cost pricing have the effect of transferring funds from the producers of lower priced gas to the consumer in the form of lower prices, and to the producers of new and especially high-cost gas in the form of higher prices."

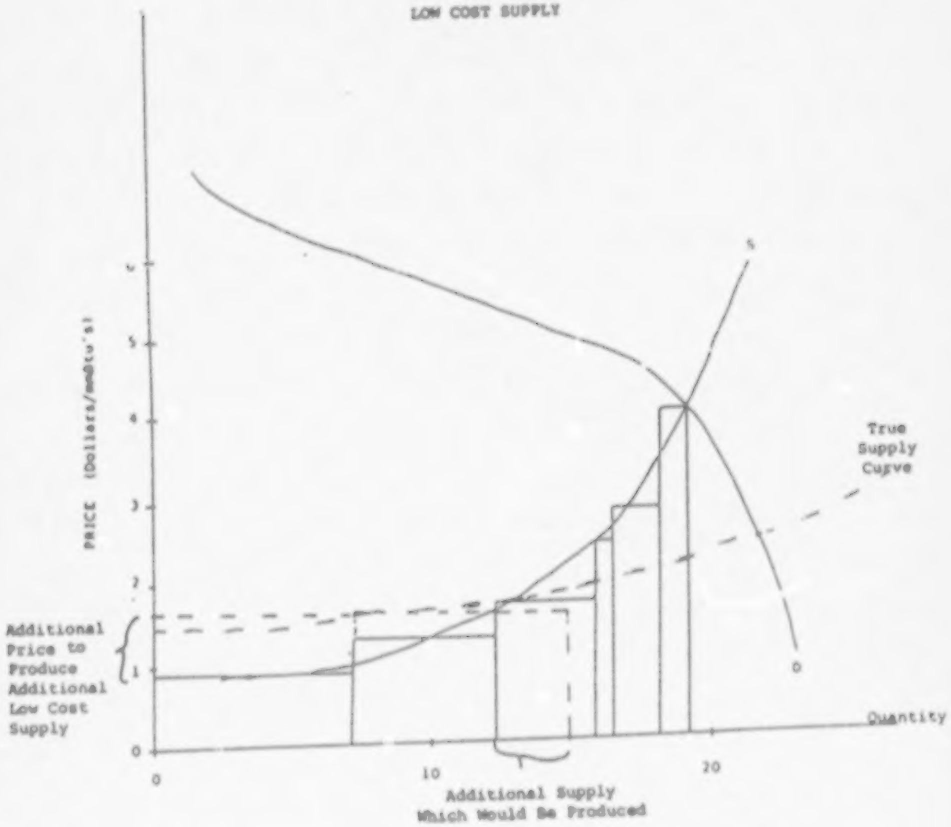
The Administration's View of NGPA

The Reagan Administration does not agree with this assessment of NGPA.

[As depicted in Figure 5] the Administration is not simply Market Hopeful; it believes that the regulatory scheme of NGPA is perverse. The ceilings on lower cost supply are too low, which increases the quantity of high cost gas necessary to clear the market and drives up average prices. In addition [as

FIGURE 5

ADMINISTRATION VIEW:
LOW PRICE CEILINGS ON
LOW COST SUPPLY



depicted in Figure 6], contract provisions, such as high percentage take-or-pay provisions, brought about by partial regulation and perverse incentives to look for expensive gas, further restrict low cost production. This also drives up market clearing and average prices.

Further [as depicted in Figure 7], partial controls induce perverse contract clauses such as indefinite price escalators and most favored nation clauses which were used by pipelines to attract discovery of new supplies. These created the potential for a price fly up upon decontrol.

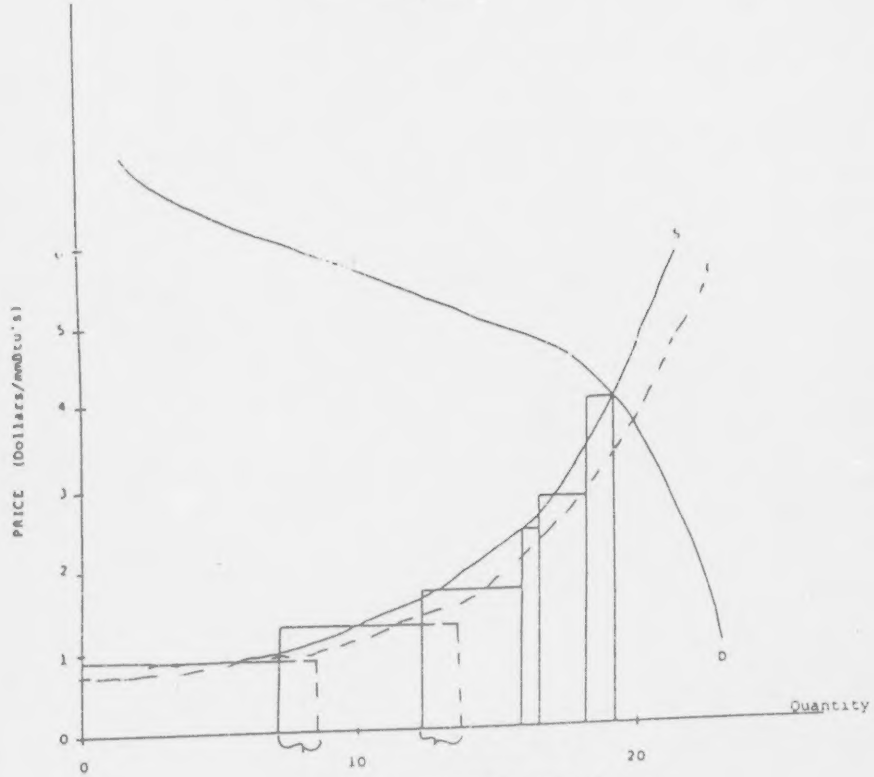
In summary, the Administration views the supply curve as fundamentally distorted by controls. In the first instance, and to an unmeasureable degree, it is distorted by the very presence of controls. At a more concrete level, it has been distorted by specific contract provisions. [As depicted in Figures 6 and 7], the supply curve rotates to higher market clearing and average prices on a fulcrum point which is defined by the quantity of low cost gas not produced.]

[As depicted in Figure 8] the Administration has, in essence, a price ladder in mind in which January 1, 1985 witnesses a sharp price run up, while current average prices have been driven above the short term average price that would prevail absent controls and their attendant aberrations.

I must say that any belief in a short term drop in prices as a result of decontrol must be relying heavily on optimism about the supply curve. Given the large quantity and actual price of old gas that is flowing, it is impossible that prices

FIGURE 6

ADMINISTRATION VIEW:
CONTRACT PROVISIONS REDUCE
LOW COST SUPPLY



Low Cost Supplies Not Produced
Due to Take-Or-Pay Provisions

FIGURE 7

ADMINISTRATION VIEW:
POTENTIAL FLY UP
UPON DECONTROL

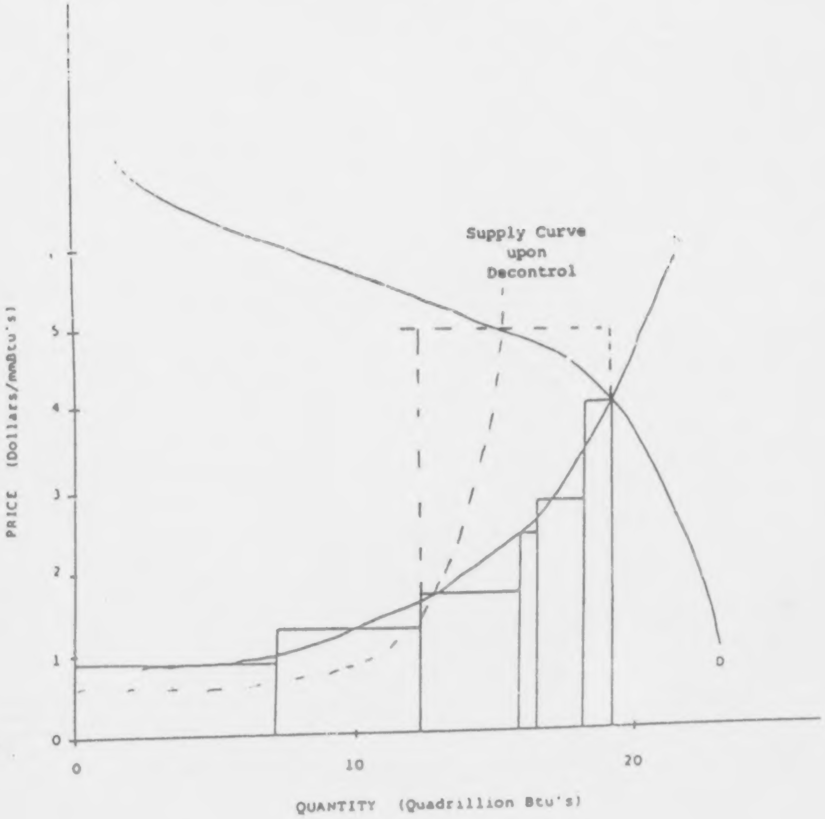
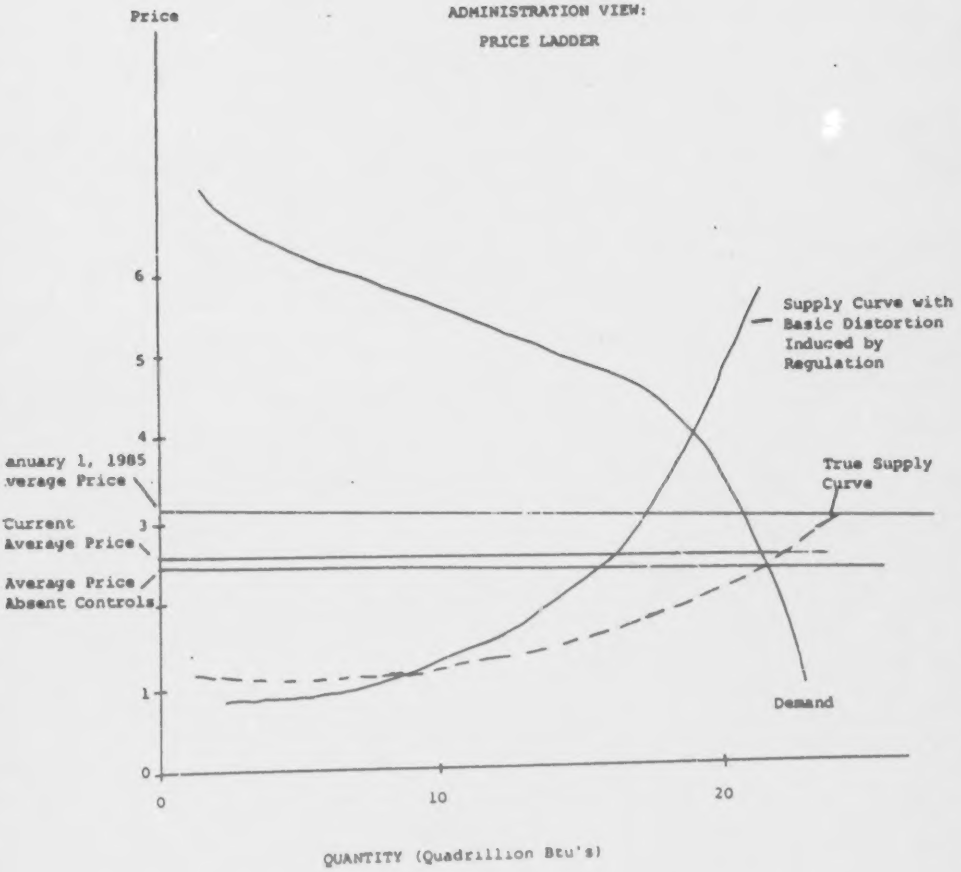


FIGURE 8

ADMINISTRATION VIEW:
PRICE LADDER



will go down as a result of market forces, unless the market clears at a much lower percentage of oil prices than the 70 percent figure the Administration has asserted over the years.

However, the policy conclusions embodied in the Administration's recent proposals are consistent with their basic assumptions about the market. If latent competition exists and if the supply curve is relatively elastic, the Administration could be correct in its assertion that a period of intense negotiations -- made more intense by deadlines -- might exorcise the contract provisions quickly enough to smooth the way toward a completely deregulated market. Moreover, competition would prevent a reemergence of these aberrations in the long term. Non-competitive profits would not emerge, but rents would be collected by producers.

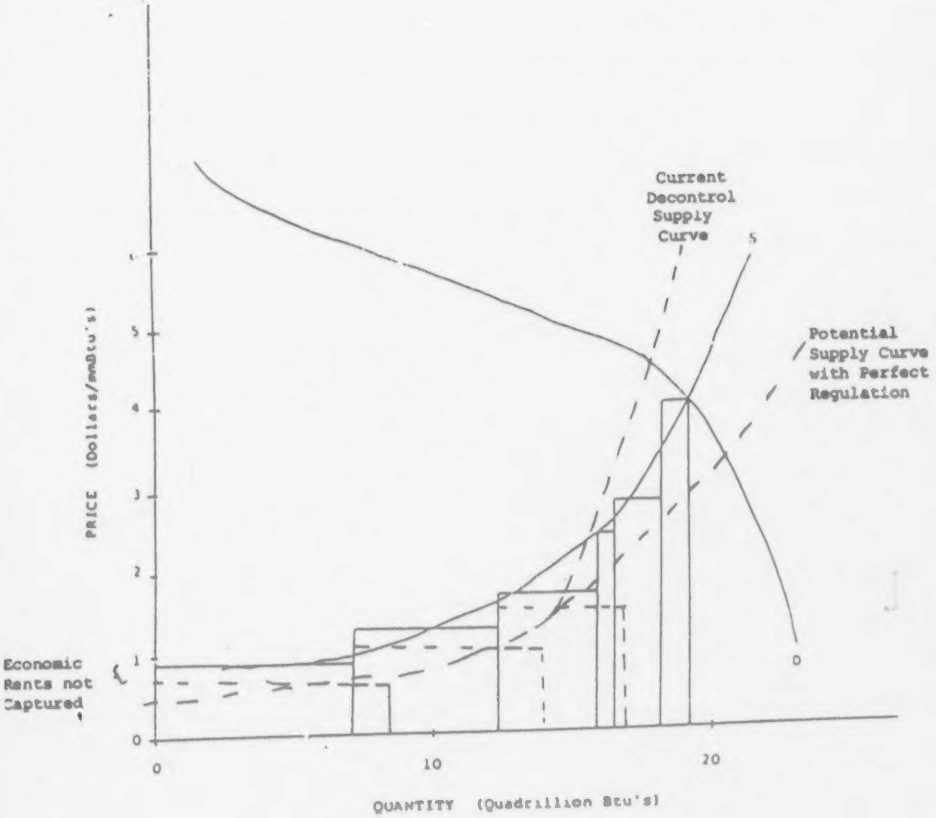
An Alternative View of NGPA

One of the interesting things about the current debate is the significant agreement about the symptoms that are affecting current prices and might affect future prices. The Market Protectors agree on the deleterious effects of take-or-pay clauses and escalators. However, they do not accept the Administration's diagnosis of the disease. They do not accept the argument that these provisions are simply a response to partial regulation or non-price competition for supplies. Instead, they argue that these are caused by the basic imperfections of the market (maldistributed bargaining power, affiliations, etc.). [As depicted in Figure 9] they also argue that

FIGURE 9

MARKET PROTECTORS'S VIEW:

PRICE CEILINGS TOO HIGH



many price ceilings for lower priced gas are too high, not too low, thereby needlessly failing to capture rents.

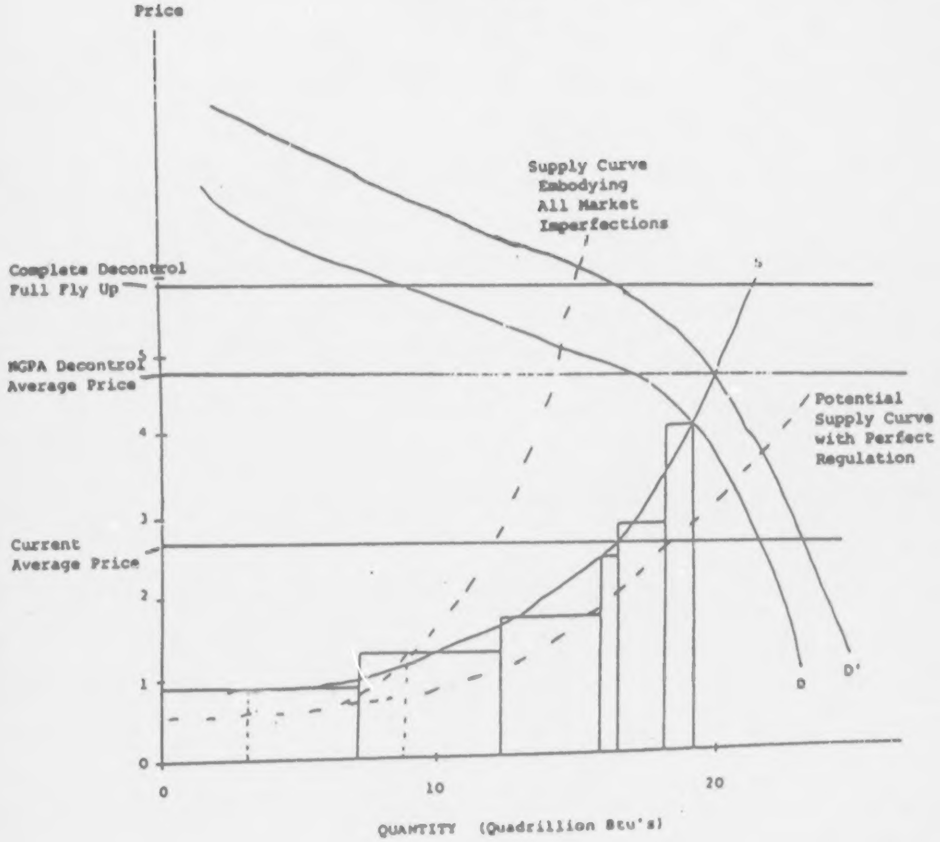
[As depicted in Figure 10] the MPs have a different price ladder in mind. Current prices are higher than they would be if the ceilings could be readjusted and the contract and perverse incentives could be eliminated. Complete decontrol leads to a price that embodies all market imperfections. Indeed, with sixty or seventy percent of gas decontrolled, they fear that the NGPA's January 1, 1985 price fly up could push the average price close to the complete decontrol level. Contract provisions would trigger and producers would have adequate market power to drive most low cost gas out of the market (to a share of 20 percent, for example). Industrial load would plummet (loss of another 2.5 TCF, for example), but producers would be immune to the extent that they maximize profits by clearing the market in the captive sector.

It must be stressed that the MPs see the underlying structural conditions in the industry, not the structure of NGPA, as the main force that has driven prices up by eroding low cost supply. They blame FERC, by an error of omission (failure to define abuse strictly enough), for failing to prevent these contracts and pricing practices and they blame FERC, by an error of commission (through rate proceedings and rulemakings), for pushing up the cost of gas through a series of decisions. Since they see the problem as being lodged in the industry and in "do nothing" regulators, they propose a restart of NGPA. Emphasizing the success of NGPA on the supply side, they would move the

FIGURE 10

MARKET PROTECTOR'S VIEW:

PRICE LADDER



current regulatory scheme back toward the underlying supply curve to maintain the supply response while recapturing rents and preventing oligopoly profits.

If the Market Hopefuls' blind spot lies in the assumption that the supply response will be better in the future, the Market Protectors have difficulty demonstrating the contribution of non-competitive factors to the present situation. There are a few clear examples of these factors, including the recent Columbia Transmission Company ruling by an Administrative Law Judge at FERC that demonstrated the abusive effect of affiliations and contract provisions, as well as the very slow pace of renegotiation of old contracts, which demonstrates the maldistribution of bargaining power in the market. On the other hand, the arithmetic of sales between subsidiaries and other types of affiliations is not overwhelming in their favor. Nor does the burgeoning independent production sector, which has produced the supply side response under NGPA, and the expanding potential for alternative supplies make the oligopoly/monopoly case any easier to prove.

Empirics and Ethics

It is absolutely critical to recognize that where you think we are and where you want to go are separate considerations. You can believe that we are in the situation of perverse regulation and want to move to improved regulation. Or, you can believe that we are in the position of imperfect regulation and want to move to complete deregulation.

Where you think we are is an empirical question. Where you think we should go is a moral, normative and ultimately political question. In addition, it should be obvious that how you think we got to where we are will dictate how you think we should get to where you want us to be.

The Administration believes that we are in the position typified by low ceilings, perverse regulation and potentially elastic supply. It wants to get to a completely free market. The principles set out in S. 615 assume that we are in the position typified by high ceilings, perverse contracts and potential oligopoly or monopoly profits, in addition to very large rents. It aims at better regulation and a much longer transition to a free market.

There are also many hybrid or mixed positions, distinguishable primarily by a concern about rents or a moderate concern about market imperfections. Distributors fall close to the MPs' position (since they feel unable to influence the producer/pipeline negotiations). The American Gas Association (AGA), which represents distributors, for example, advocates continuation of controls on old gas. It may be concerned about the rents and want to ensure that they are captured by consumers, or it may be concerned about the market share of gas in total energy demand and want to use low cost gas to keep its share of the industrial market. AGA also expresses some concerns about non-competitive conditions between wellhead and city gate and mumbles things about contract carriers, etc.

On the other hand, there are positions like that of the

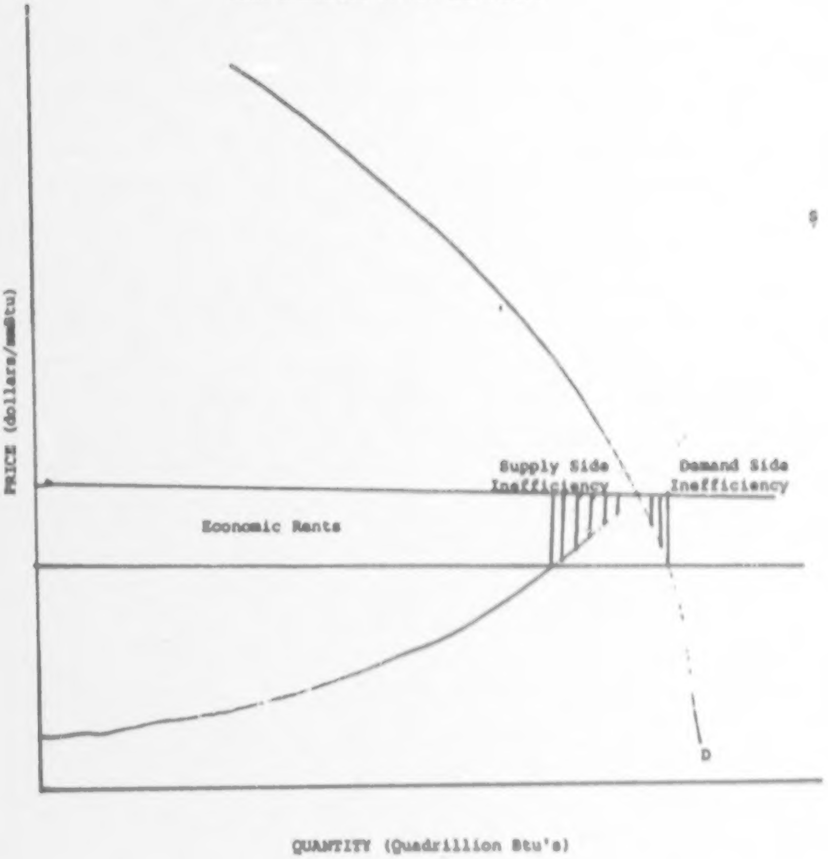
New York Times, which is closer to the Market Hopefuls but worries about the rents and calls for a windfall profits tax, which, I would point out, is an inefficient way to capture rents. The Times wants to capture half the rents (a 50 percent tax). A tax incidence analysis will show that consumers would pay a large part of the tax. It is not clear that the Times cares much about who pays. But it is important to acknowledge that why you want to capture the rents and how you go about it makes a great deal of difference.

It is also critically important to recognize the equity implications of the empirical reality of the fossil fuels market. The essence of our political choice in the pricing of a commodity such as natural gas is the recognition that both the supply and demand elasticities are low and, therefore, that equity/efficiency trade-offs are difficult. Because rents are so large and supply and demand responses to price changes are small, equity losses (i.e., the transfer of surplus or wealth from consumers to producers) tend to be much larger than efficiency gains (i.e., the increase in national economic output that would result from a reallocation of resources). It is absolutely critical to recognize that even though the pie gets bigger, the redistribution of benefits may be so radical that there are large groups -- actually a significant majority -- that would be worse off.

Figure 11 shows this concept using the composite supply and demand curves of Figure 10. The figure assumes captive

FIGURE 11

THE EQUITY-EFFICIENCY TRADE OFF
WITH INELASTIC SUPPLY AND DEMAND



consumers and creates a composite demand curve. It does not assume oligopoly pricing. It assumes a solution to the contract problem and the "true" supply curve as viewed by MPs, but not an optimistic supply response as hoped for by MHs.

The classic supply and demand side inefficiencies of price controls are identified as striped areas in the figure. One can hypothesize a number of other inefficiencies including those associated with curtailments or administrative allocation of supplies, if or when either arises. Further, there are certain import inefficiencies one can hypothesize. However, the basic supply and demand side inefficiencies are the core of the matter. The point, as shown in the figure, is that the extremely inelastic supply and demand responses yield small efficiency gains, while the inelastic supply curve creates very large wealth transfers.

This is the case with fossil fuel prices -- both natural gas and petroleum. As the Department of Energy's economic analysis of a year ago showed, the decontrol of natural gas increased the size of the national economic pie but reduced the share of it received by labor and capital in non-gas industries. CECA did an analysis of that DOE study which examined the process in detail, entitled "Natural Gas Decontrol: A Case of Trickle-Up Economics," which I submit to the Committee. In essence, we found that for every one dollar of growth, there were two dollars of wealth transfer. And that was after ten years in which the recessionary shocks of wealth transfers had been allowed to work their way out of the system. The fascinating thing is that much the same relationship appears to hold for oil price increases -- for every one dollar of efficiency gain, there are two dollars of wealth transfer. In short, even if you think the market works in economic terms, you could well want to intervene because of the equity impact.

Empirics and Policy

Empirically, I read the evidence as strongly suggesting that there are massive and pervasive imperfections in the market that mandate consumer protection and regulatory relief. I should point out that the supply and demand curves I have used in my graphs are not theoretical -- they are the supply and demand curves implicit in the Department of Energy's Analysis of the Natural Gas Policy Act. They would be consistent with the GAO analysis as well.

I drew those curves in February, 1982 in an Appendix to a report CECA did on natural gas prices. With your permission, I submit the analysis for the record. In the report, I estimated that the oligopoly solution would cause the natural gas market to reach a partially non-competitive equilibrium in which 6 percent of total demand is lost. If one assumes that the producers are sensitive only to demand in the captive market and that they therefore raise prices higher than they would if they were concerned with demand in the total market, the estimate of foregone demand would rise to 16 percent. This demand would be lost in the industrial market since the non-competitive rate of profit is maximized by not competing against lower cost oil. The result is that the projected market clearing price would be between 7 and 15 percent higher than the competitive market clearing price calculated by DOE.

The evidence that has accumulated with respect to the behavior of the natural gas market, much of which has come to light in the past year, contains nothing that would lead me to abandon that view of the market. The maldistribution of market power seems quite evident in the behavior of contracts and the progress of contract negotiations. If one is willing to consider this explanation of behavior, the empirical evidence is not surprising at all.

It is not surprising to find, as a 1981 study by the American Gas Association did, that 30 percent of all contracts on pre-1973 gas had been renegotiated in a very short period of time to include escalator clauses.

It is not surprising to find, as EIA and GAO studies have, that, for all intents and purposes, the entire industry has indexed its prices to that of No. 2 oil, not the market in which retail gas distributors compete -- which is No. 6 oil -- but the market in which major integrated oil companies maximize their profits.

It is not surprising that when a few pipelines have tried to claim force majeure as their markets collapsed, producers have sued, saying, in essence, that they are immune to market forces and will extract whatever they can from the highest price market available.

Indeed, the almost lightening speed with which these contract provisions worked their way into every nook and cranny of the industry and the snail's pace at which a very few of them have been modified, testifies to the maldistribution of the chips in the bargaining process.

Beyond the specifics, an even more powerful piece of evidence lies in the response of natural gas prices to the deepest recession since the Great Depression. The demand for natural gas and oil has plummeted. In response to the recession-induced decline in demand, crude oil prices have fallen about 10 percent. About 1.5 trillion cubic feet of industrial demand for natural gas has been lost (.5 trillion cubic feet permanently) and three trillion cubic feet of excess supply has developed in the natural gas market. Did the free negotiations between producers and pipelines change the contract terms which were propping up prices? Did those immense downward pressures have any effect on prices? Not at all. With oil prices falling and inflation running at 4 percent, natural gas prices have increased by over 20 percent.

The flaws that I see in the natural gas market operate at different levels of intensity in different regions of the country and at different moments in time, but taken together they constitute a fundamentally flawed market structure. The fact that FERC has failed to stop transactions at very high prices, even though it has the power to do so, is important. The fact that these transactions occur in the first place is paramount, and it is a direct result of the institutional and structural imperfections in the gas market.

Clearly, I have a fundamentally different view of the marketplace than that of the Administration. The difference embodies both an empirical and an ethical judgment.

The Administration looks at the current situation and sees the NGPA price ceilings pushing pipelines to engage in non-price competition to attract supplies. Thus, it identifies these ceilings as the origin of the contracts problem.

I look at the fact that pipelines have Purchase Gas Adjustment (PGA) clauses which can be used to pass through price increases directly to consumers and see absolutely no incentive for them to bargain in the consumer's interest. I look at the close affiliation between producers and distributors and see a serious lack of arms-length transactions leading to a strong interest in price increases.

The Administration looks at the supply side of the market and sees fierce competition and rosy supply prospects. Thus, it predicts a fall in prices upon decontrol.

I look at the fact that the twenty largest producers of natural gas produce more than half our gas and two-thirds of our oil, and see an oligopoly situation with little likelihood of anything but price increases. I look at the restricted access to supplies in the field and see further possibilities of oligopoly profits.

The Administration looks at the one third of the market in which there is significant interfuel substitutability and sees competition at the burner-tip. Thus, it sees no need for consumer protection through regulation.

I look at the two-thirds of the gas market which is captive and see a monopoly situation which creates the potential for unjustified, inefficient monopoly profits.

The Administration looks at tens of billions of dollars in economic rents on natural gas production that results from an inelastic supply curve and sees only the free market distribution of wealth.

I look at those rents and see an uneconomic allocation of social resources and a powerful source of human despair as the cost of a vital necessity rises beyond the means of millions of Americans.

The Policy Conclusion

Obviously, a very different policy position emerges from this reading of the empirical record and this statement of principles:

1. Old gas must not be decontrolled or it would capture about half of the economic rents that are likely to be available on natural gas production through the end of this decade.
2. Indefinite price escalators -- which use other forms of energy as a referent -- and most-favored nation clauses -- which refer to other gas prices -- must be abolished. This cross-referencing of prices violates the very essence of competition at the wellhead and the burner tip.
3. Take-or-pay clauses must be set at levels necessary to do what they were intended to do -- provide stable finance for the industry. They must not be allowed to be used to bid for gas or to ensure producers unjustified profits.
4. All automatic pass throughs must be permanently eliminated to remove the insulation of pipelines from the consequences of their bidding practices.

5. The discretionary powers that FERC has used to push up the price of gas must be abolished and the damage that it has done must be corrected. Unless this is done, the perverse incentives that FERC has created will continue to distort the supply-response, extracting rents from consumers.

6. The rapid increase in inflation over the first several years in which NGPA was in place have distorted the price increase formulae, in addition to creating extremely large price increases. These must be rolled back and only much smaller annual price increases must be allowed.

7. The definition of fraud and abuse that FERC has been allowed to apply under NGPA has proven totally inadequate to protect consumers. Therefore, we must return to the "just and reasonable" standards of the Natural Gas Act.

It is of paramount importance to stress the fact that the Administration's package is not consumer protection.

It is not consumer protection to give a blank check to the very same parties who created the problem in the first place and who have been unable to solve it in more than two years when downward pressures on price have been intense.

It is not consumer protection to decontrol old gas and allow it to rise to the world-market oil price, when that gas has been flowing for decades and costs nickles to produce.

It is not consumer protection to impose a three year moratorium on abusive contract practices, without addressing any of the underlying structural causes of those practices.

It is equally important to stress the fact that the Administration's solution is not an economically efficient solution.

The transfer of economic rents to and the extraction of non-competitive profits by the natural gas producers, especially the majors who own the majority of the old gas, will simply drain more resources away from other sectors of the economy that are in desperate need of capital and consumer spending. It will create a natural gas price drag on the economy, at the very moment that the oil price drag of the second energy price shock has finally begun to work its way out of the system.

To allow politically-manipulated oil prices to set the price of natural gas, as the Administration's proposal would do, is to give up all hope of allocating our economic and energy resources in a manner that is consistent with the economic forces, values and needs of our domestic economy.

Only through the measures we propose can we ensure that the price of gas will be driven by the competitively determined costs of production, thereby achieving both consumer protection and national economic efficiency.

I appreciate this opportunity to testify before you today and would be happy to work with the Committee as you grapple with seeking equitable solutions to these problems.

NATURAL GAS PRICE DEREGULATION:
A CASE OF TRICKLE UP ECONOMICS

Prepared by:

CONSUMER ENERGY COUNCIL OF AMERICA
RESEARCH FOUNDATION

January 28, 1982

TABLE OF CONTENTS

Chapter Page

I. GENERAL INTRODUCTION 1

A. The Department of Energy's Natural Gas Analysis 3

1. DOE's Natural Gas Market Model 3

2. DOE's Macroeconomic Analysis 4

a. Supply-Side Model 4
b. Demand-Side Models 5

B. The Basic Message: Trickle Up Economics 6

II. THE IMPACT OF DECONTROL 8

A. Details of the Analysis 8

1. Impact on Labor and Other Sectors 11

2. Impact on Productivity and Gas Production 12

B. DOE's Sleight of Hand 14

1. Differential Treatments of Changes in GNP 14

2. Denial of Income Transfer Effects of Deregulation 15

C. The Econometric Results 17

1. Similarities and Differences 17

2. Explanation of the Differences 20

III. CONCLUSION 25

FOOTNOTES 26

LIST OF TABLES

Page

Table 1:
SUMMARY OF THE MACROECONOMIC EFFECTS OF FULL DECONTROL IN 1982 OF NATURAL GAS PRICES 9

Table 2:
SUMMARY OF THE MACROECONOMIC EFFECTS OF PHASED DECONTROL OF NATURAL GAS PRICES 10

Table 3:
SUMMARY OF THE EFFECT OF DECONTROL ON PRODUCTIVITY AND NATURAL GAS PRODUCTION 13

Table 4:
THE MACROECONOMIC EFFECTS OF FULL DECONTROL DEPICTED IN THREE DIFFERENT MODELS 18

Table 5:
THE MACROECONOMIC EFFECTS OF PHASED DECONTROL IN TWO DIFFERENT MODELS 21

NATURAL GAS PRICE DEREGULATION: A CASE OF TRICKLE UP ECONOMICS

I. GENERAL INTRODUCTION

The decontrol of natural gas prices may be the single most important energy policy decision of the 1980s. Natural gas is the dominant household fuel. With more than half the households in America heating, cooking and heating water with natural gas, it accounts for almost 55 percent of all the energy used in the home.[1] Natural gas is also a prime industrial fuel, accounting for 31 percent of all the energy consumed by industry.[2]

Since many of the uses of natural gas are vital to basic daily activities and economic processes, the decontrol of natural gas prices could have a greater impact on the nation's consumers and the economy than any other energy pricing policy decision. Thus, any decision to decontrol natural gas should be based on a careful, rigorous and objective analysis of the costs and benefits that will flow from such a decision. This is no easy matter.

Responsible analysis of natural gas decontrol is an extremely complex task. The natural gas market itself, as well as the link between energy and the economy, is complicated and not well understood. Beyond that, the impact of rising prices on the distribution of wealth is difficult to measure. Finally, the special interests involved in any decision to decontrol are extremely powerful and passions run high because so much is at stake. A great deal of information (and misinformation) must be sorted out, analyzed and evaluated in order to conduct a proper analysis.

Fortunately, the analysis of the decontrol of natural gas need not be based on pure theory or guesswork. Over the past decade, because energy policy has been such a critical issue, the analytic tools used to examine policy decisions have been greatly improved. Moreover, in the last five years the nation has experienced four major decontrol decisions: heating oil (May 1976), natural gas (August 1978), crude oil (June 1979) and gasoline (January 1981). A track record has been established which should shed considerable light on how the energy markets and the economy behave in the wake of decontrol. It should also give clues to which tools and approaches best predict the outcome.

With this report, the Consumer Energy Council of America Research Foundation (CECA/RF) initiates a series of studies which will examine the history of oil decontrol and predictions about natural gas decontrol. CECA/RF's series of studies will review the record of price projections and price increases, the supply and demand responses and the economic and equity impacts of crude oil decontrol and contrast them with the various projections for natural gas decontrol. Future reports will also examine the potential and actual effects of windfall profits taxes.

This initial report, however, takes a somewhat different approach. It examines basic philosophical, theoretical and technical aspects of the Department of Energy's most recent analysis of natural gas decontrol.[3] We believe that there is a message of such shocking significance in the DOE analysis -- that natural gas decontrol isn't trickle down economics, it is trickle up economics -- that we will postpone discussion of a number of issues (such as price projections, supply and demand elasticities, etc.) which should be dealt with first, and move directly to the heart of the matter.

A. The Department of Energy's Natural Gas Analysis

1. DOE's Natural Gas Market Model

The Department of Energy's study of natural gas decontrol consists of two separate analytic exercises. The first exercise involves an attempt to model the natural gas market.[4] That is, using certain assumptions about production costs, the geological availability of gas and the economic demand for gas, DOE predicts the supply of and demand for gas under various decontrol scenarios.

2. DOE's Macroeconomic Impact Analysis

In the second exercise, DOE uses the supply, demand and price predictions from its natural gas modeling exercise above as inputs into the analysis of the macroeconomic impact of decontrol.[5] The objective is to predict the impact of decontrol on the Gross National Product (GNP), inflation, employment and other measures of the performance of the economy.

For the purposes of the macroeconomic analysis, DOE uses three different models, one of which is called a supply-oriented model and two of which are called demand-oriented models. The difference between the models, as DOE sees it, is as follows:

a. Supply-Side Model

The supply-side model (specifically the Hudson/Jorgenson Dynamic General Equilibrium Model) is driven by supply conditions -- the productivity conditions in the economy and changes in the supply of inputs for production (i.e., the factors of production, capital and labor). To simulate the impact of decontrol, that impact is measured by changes in potential GNP (the output that could be achieved if all factors of production were fully utilized).

b. Demand-Side Models

The demand-side models (specifically the Wharton Annual and Industry Forecasting Model [WAIFM] and the DRI Model) are driven by demand conditions -- the level of aggregate demand -- to simulate the impact of decontrol. The impact is typically measured by changes in actual GNP, consumption and employment.

DOE's preference for the supply-oriented model is quite evident in its discussion. This report will demonstrate that the differences in the output of the models are not as great as DOE suggests and that they are really related to a rather different factor -- an assumption about the wage-price spiral.

Each of the analyses, as well as the interconnection between them, is extremely complex. However, careful reading of all of DOE's natural gas analyses (in addition to the study itself, there are four appendices as well as several attachments and annexes) reveals numerous points at which critical assumptions are made by DOE which dictate the nature of the results. At each of these points, the assumption chosen by DOE is highly favorable to decontrol. We have grave doubts about DOE's assumptions in both the natural gas market analysis and in the macroeconomic analysis and we believe that these assumptions call into question the value of the entire analysis for decisionmaking.

It would be most logical to begin CECA/RF's series with a critique of the gas market model and then examine the macroeconomic analysis. However, we believe that there is a message about supply-side economics in DOE's study that is of such overwhelming importance that we will devote our first report to a discussion of DOE's macroeconomic analysis. In other words, for the moment, we will not question DOE's assumptions and projections about the gas market and will concentrate instead on the implications of a so-called "supply-oriented" natural gas policy for the economy.

B. The Basic Message: Trickle Up Economics

Supply-side economics is typically presented as a strategy for increasing the national economic pie. By creating incentives to save and invest, it is argued that all members of society can be made better off. That is, the pie gets bigger and everyone can benefit by taking a bigger piece. However, in order to expand the pie, it is necessary to transfer resources from those with a high propensity to consume (low and moderate income groups) to those with a high propensity to save (high income groups).[6] In the first instance, then, it is a small group that benefits. It is only at some later date, if output expands and if resources "trickle down," as David

Stockman admitted in the widely publicized December 1981 Atlantic Monthly article, that the great majority of citizens can benefit.

In fact, DOE's own analysis of natural gas decontrol shows that supply-side economics in the natural gas market is not trickle down economics at all -- it is trickle up economics. With a massive transfer of wealth to gas producers, DOE's analysis shows that the pie might get a little bigger, but even after 15 years only those who own gas related capital services (i.e., owners of gas industry stocks) will be better off. Everyone else, i.e., labor and owners of non-gas related capital services, would still be worse off even after 15 years.

That this outcome is abundantly clear, even granting DOE's optimistic assumptions, should be a cause of concern to both the supporters and opponents of supply-side policy. Let us look at this troubling result in detail.

II. THE IMPACT OF DECONTROL

A. Details of the Analysis

Table 1 presents the results of DOE's analysis of the impact of full decontrol on the aggregate GNP and the distribution of income between owners of capital and labor. Potential GNP is projected to increase by $41 billion -- or half a percent -- over the 15 year period (in constant 1980 dollars). Labor's gross income is projected to decline by $53 billion. The income of non-gas-related capital is projected to decline by $28 billion, while the income of gas-related capital is projected to rise by $122 billion.

Table 2 presents the results of DOE's analysis of accelerated/phased decontrol (a scenario for decontrol that closely approximates the proposals being discussed for legislation in early 1982). Potential GNP is projected to increase by $38 billion (1980 dollars) over the 15 year period. Labor's gross income is projected to decline by $35 billion, while that of non-gas-related capital is projected to decline by $21 billion. The income of gas-related capital is projected to rise by $95 billion.

To summarize this result simply, for every one dollar of additional income that holders of gas-related capital gain, labor loses fifty cents and holders of non-gas-related capital lose twenty-five cents. Supply-side magic (i.e., increasing investment) creates the

Table 1

SUMMARY OF THE MACROECONOMIC EFFECTS OF FULL DECONTROL IN 1982 OF NATURAL GAS PRICES

(Billions of 1980 Dollars)

Changes from the current policy situation in:

	Real GNP	Gross Income		
		Labor	Capital	
			Gas-Related	Other
1982	- 8.5	-37.1	+33.4	- 4.8
1983	- 6.7	-33.0	+30.5	- 4.3
1984	- 5.5	-30.0	+29.3	- 4.8
1985	- 3.9	+ 0.9	+ 4.1	- 1.1
1986	+ 5.1	+ 2.3	+ 4.3	- 1.4
1987	+ 5.7	+ 3.7	+ 3.4	- 1.4
1988	+ 5.1	+ 3.7	+ 2.7	- 1.2
1989	+ 5.7	+ 4.4	+ 2.7	- 1.2
1990	+ 6.0	+ 5.0	+ 2.3	- 1.2
1991	+ 5.3	+ 4.6	+ 2.0	- 1.2
1992	+ 6.0	+ 5.1	+ 2.1	- 1.2
1993	+ 6.6	+ 6.9	+ 0.9	- 1.2
1994	+ 6.0	+ 5.1	+ 2.3	- 1.4
1995	+ 6.0	+ 5.1	+ 2.1	- 1.2
Cumulative Effect	+40.7	-53.3	+122.1	-27.8

Source: U.S. DOE, Macroeconomic Consequences, p. I-ii.

Table 2

SUMMARY OF THE MACROECONOMIC EFFECTS OF
PHASED DECONTROL OF NATURAL GAS PRICES
(Billions of 1980 Dollars)

Changes from the current policy situation in:

	Real GNP	Gross Income		
		Labor	Capital	
			Gas-Related	Other
1982	- 3.4	-14.7	+ 13.1	- 1.8
1983	- 6.2	-25.6	+ 22.4	- 3.0
1984	- 6.7	-30.3	+28.2	- 4.6
1985	+ 3.9	0.0	+ 4.8	- 0.9
1986	+ 5.3	+ 1.6	+ 5.1	- 1.4
1987	+ 5.1	+ 2.8	+ 3.7	- 1.4
1988	+ 4.6	+ 3.0	+ 2.7	- 1.1
1989	+ 5.1	+ 3.5	+ 2.7	- 1.1
1990	+ 5.3	+ 4.1	+ 2.5	- 1.2
1991	+ 4.6	+ 3.7	+ 2.0	- 1.1
1992	+ 5.3	+ 4.3	+ 2.0	- 1.1
1993	+ 4.3	+ 3.5	+ 1.4	- 0.7
1994	+ 5.3	+ 4.3	+ 2.1	- 1.1
1995	+ 5.3	+ 4.4	+ 2.0	- 1.1
Cumulative Effect	+37.8	-35.4	+94.7	-21.4

Source: U.S. DOE, Macroeconomic Consequences, p. I-43.

additional twenty-five cents that owners of gas-related capital gain. That is, the pie may get a little bigger as a result of decontrol, but just about everyone will get a smaller piece. In fact, the transfer of resources (the losses in income of labor and owners of non-gas industry stock) is nearly twice as large as the increase in the total pie (the increase in GNP). Moreover, these are the bottom line results after all costs and benefits of decontrol have been considered.

1. Impact on Labor and Other Sectors

According to DOE's study, the magnitude of the gains and losses is quite similar under either full or phased decontrol. The pattern of losses is also similar in both cases. Labor loses big in the first three years, then recovers slightly, but still remains the biggest loser. Labor's losses in the first three years total over $100 billion (in constant 1980 dollars) for full decontrol and $70 billion for phased decontrol.

Holders of non-gas-related capital are small but steady losers. Their income is reduced every year for the entire 15 year period. The losses in income appear to be concentrated in industries which are presently under the greatest pressure -- automobiles, home building and agriculture. Those losses are greatest in the early years.[7]

2. Impact on Productivity and Gas Production

It is also important to recognize that, according to DOE's analysis, these effects of decontrol -- the small increase in the total pie and the much larger redistribution in income -- would occur without increasing the amount of natural gas produced and without increasing productivity in the economy (see Table 3). In fact, productivity would actually decline.

The loss of GNP due to the reduction in productivity that would result from decontrol would be between .5 and 1 percent over the 15 year period. The losses would be concentrated in the early years. Further, although decontrol would lead to greater supplies of gas in the early years, these would be offset by lower supplies in the later years and total supply over the period would be about 1 percent lower than under continuation of the Natural Gas Policy Act.

In sum, there could be no better example of a policy which is purely a redistributive scheme than natural gas decontrol. Unfortunately, although this decidedly negative message is buried in DOE's technical analysis, it is not fully reflected in DOE's presentation of the policy alternatives. Because it is not, the presentation of the policy alternative may mislead decisionmakers. The next section examines how the message was obscured.

Table 3

SUMMARY OF THE EFFECT OF DECONTROL ON PRODUCTIVITY AND NATURAL GAS PRODUCTION

	Changes in Productivity[1] (from base, in %)		Domestic Supply of Natural Gas[2] (in Billion Cubic Feet)		
	Full Decontrol	Accelerated/ Phased Decontrol	NGPA Unmodified	Full Decontrol	Accelerated/ Phased Decontrol (All New)
1982	- .32	- .13	18,147.6	18,426.9	18,243.9
1983	- .34	- .26	17,365.4	17,906.9	17,815.0
1984	- .37	- .34	16,881.8	17,611.5	17,544.2
1985	- .08	- .02	17,161.6	17,324.6	17,118.7
1986	- .07	.02	17,431.2	17,289.8	17,167.7
1987	- .03	.01	17,890.2	17,440.6	17,386.[illegible]
1988	- .02	- .01	17,884.3	17,539.2	17,524.6
1989	- .01	+ .01	17,803.8	17,436.7	17,364.4
1990	0	+ .03	17,649.7	17,144.5	17,185.2
1991	- .01	+ .01	17,487.9	17,108.5	17,161.6
1992	+ .02	+ .04	17,430.8	16,929.5	16,992.8
1993	+ .05	+ .01	17,266.3	16,926.2	16,996.8
1994	+ .04	+ .04	17,245.5	16,719.8	16,799.5
1995	+ .04	+ .04	17,164.7	16,655.8	16,734.8

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[1] U.S. DOE, Macroeconomic Consequences, pp. I-39, I-45

[2] U.S. DOE, Two Market Analysis, Attachment 4.

B. DOE's Sleight of Hand

The negative implications of decontrol have been submerged by DOE because of its subjective interpretation and selective presentation of its own evidence. It has chosen as its central criterion for policy evaluation the behavior of potential GNP in the long term, rather than the behavior of actual GNP in the short and mid terms or the distributive effects of decontrol. Furthermore, it tailors the evidence presented to this preconception.

1. Differential Treatments of Changes in GNP

For example, the Department of Energy treats a $10 billion (discounted 1980 $) potential expansion in GNP over a 15 year period as a major benefit, while it treats a possible loss in GNP of $18 billion over a three year period as small and insignificant:

> Full decontrol in 1982 creates substantial efficiency benefits: $10 billion (NPV) compared to current policy and $41 billion (NPV) when compared to continued controls to 1995. These efficiency gains are significant and play an important role in the analysis of macroeconomic effects of full decontrol. The efficiency gains are robust with respect to varying assumptions about world oil prices and gas market conditions. 8
>
> Full decontrol of natural gas prices could also have short-term impacts on measured inflation, actual output, and unemployment. These effects are not likely to be large and should fade over time. . . . Immediate decontrol is also estimated to reduce real GNP by .2 to .6 percent ($6 to $18 billion in 1980 $) and raise the unemployment rate by .1 to .2 points in the first three years of decontrol. 9

In point of fact, the analysts who generated the numbers upon which DOE opted to base its analysis (because they come from a so-called supply-oriented model) stated quite the opposite. First, the report of these analysts repeatedly points out that both the potential aggregate GNP costs and benefits were quite small.

> None of the consequences of accelerated decontrol is large; the costs are relatively small and shortlived, while the benefits are even smaller but sustained. 10

Furthermore, the same report noted that one really had to go far out in the future to reverse the negative effects:

> It is important to note however, that the projection horizon must be extended to 1990 before the early losses are offset by subsequent gains. It takes about nine years for the overall effects to become positive (in present value terms). 11

2. Denial of Income Transfer Effects of Deregulation

Even more misleading in DOE's analysis is the fact that DOE simply denied the existence of the evidence on the distributive effects of the policy. DOE claims to be uncertain about those effects:

> Although the net benefits of full decontrol in 1982 are $10 billion (NPV), the distribution of the costs and benefits is likely to be uneven. It is difficult to estimate the magnitude and the distribution of these effects among different sectors of the economy, regions, and social and economic groups. The macroeconomic and efficiency analyses show that all families *could be* made better off as a result of decontrol. 12

The analysts who generated the numbers were emphatic and insistent about the distribution of costs and benefits:

> Thus, accelerated decontrol involves a relative shift of real income or purchasing power from the owners of labor services to the owners of capital services and, among the latter, from the owners of other capital assets to those having claims on the capital associated with domestic gas supply. 13

Other biases in DOE's analysis lie in its differential treatment of macroeconomic models and the shifting of time frames in which the models are applied.

The supply-side model, which has been little used for analysis such as this, is presented without discussion of its limitations or caveats. Needless to say, it produces the most favorable results. The more traditional models (referred to as demand-oriented) are criticized severely. There is really little reason to assume that the supply-side model is any less subject to doubt than the other models. In fact, as will be shown below, the differences between the models have been exaggerated and can be easily explained.

Furthermore, the most favorable model is run over a long time frame (for decontrol compared to present policies) in order to let small positive factors build up to erase the initial negative factors. The less favorable models, which begin to show small negative impacts in later years (for decontrol compared to present policies), are run over a shorter time frame. There are some very good reasons to believe that decontrol would lead to negative impacts relative to continuation of present policies in the late 1980s and after. As noted above, the continuation of present policies would bring more gas to market in that later period. Thus, the possibility that present policies will be preferable to decontrol in that period is real. The shifting of time frames in DOE's analysis obscures what may be a legitimate and important difference in the estimation of effects.

Amid this obfuscation it is difficult to assess properly the econometric results. A careful review of the output of all the models employed by DOE and the assumptions on which they are based shows that (1) they are not all that different and (2) the differences that exist are theoretically and technically explicable. The next section will analyze DOE's models with the objective of clarifying, rather than obscuring, their important features and pinpointing the message they send about supply-side economics in the natural gas market.

C. The Econometric Results

1. Similarities and Differences

For all the fuss made about differences between the supply-oriented and the demand-oriented approaches, there simply is not that much difference between the two sets of results for full decontrol (see Table 4). Over a comparable time frame (9 years), projected changes in GNP

Table 4

THE MACROECONOMIC EFFECTS OF FULL DECONTROL
DEPICTED IN THREE DIFFERENT MODELS
(Change from Base Case) 1/

	GNP (Percent)			Inflation (Percentge Points)			Labor			Investment (Percent)		
	H/J	D	W	H/J	D	W	H/J^2	D^3	W^3	H/J	D	W
1982	- .31	- .32	- .4	2.18	1.7	2.5	.01	.1	.2	3.81	-1.1	- .1
1983	- .24	- .61	- .4	- .33	.7	.4	- .03	.2	.1	3.28	-2.1	- .5
1984	- .19	- .43	- .2	- .24	.1	.2	- .05	.2	0	3.35	-1.4	1.8
1985	.13	.13	.4	-1.72	- .9	-2.0	- .11	0.0	- .3	.41	.1	3.1
1986	.17	.37	- .3	- .06	- .9	- .5	- .10	- .1	.1	.40	1.2	- .3
1987	.18	- .08	.1	- .06	.2	- .3	- .08	- .1	- .1	.31	.3	1.2
1988	.16	- .07	.1	0.0	.1	0.0	- .09	- .1	- .1	.21	0	1.6
1989	.17	- .13	0.0	- .02	- .1	- .2	- .08	0.0	- .1	1.2	- .1	1.0
1990	.18	- .17	- .2	- .01	- .1	0.0	- .07	0.1	.1	.16	-0.2	0.0
Cumulative Impacts	Billions of Constant 1980 $			% Change			Job Losses (in thousands)			Billions of Constant 1980 $		
3 year	-20.7	-39.7	-27.7	+1.61	+2.5	+3.1	100	500	300	46.10	-13.1	1.6
9 year	+10.8	-40.5	-24.0	-.3	.8	.1	700	300	0	54.0	-19.5	44.7

Explanatory Notes:
1/ H/J = Hudson/Jorgenson; W = Wharton; D = DRI
2/ Measured as percent decrease in labor supply.
3/ Measured as percentage point increase in unemployment.

range from +10.8 billion (constant 1980 $) to -40.5 billion (constant 1980 $). Although these numbers may sound large, they constitute less than one quarter of a percent of GNP. All models agree on fairly substantial negative GNP impacts in the first three years. The supply-side model predicts a loss of $20.7 billion, while the largest loss predicted by the demand side models is $39.7 billion. Again, the numbers may sound large, but they present a small fraction of GNP. Further, note that the direction of the predicted impact is the same -- negative.

The demand-oriented models produce slightly longer runs of increasing inflation in the early years. But all models predict a sizable increase in inflation. The three models differ somewhat in their predictions of the three year impact on inflation (increases ranging from +1.6 percentage points to +3.1 percentage points) and their nine year predictions (-.2 percentage points to +.4).

If there are major differences in the models, they occur in the labor and investment areas. The supply-side model shows a continuous and steady decrease in labor supply and a continuous increase in investment. The decrease in the labor supply is about 100,000 person years in the short term and 700,000 in the longer term. The increase in investment is on the order of $50 billion in both the short and long terms. By implication, investment in the model is treated as energy saving and labor saving.

The demand-side models show somewhat different patterns of unemployment and investment. There is a net increase in unemployment which parallels the net decrease in labor supply projected by the supply-side model. However, the pattern is somewhat different. The demand-oriented models show larger job losses in the short term (300,000-500,000) than in the long term (0-300,000). In the long term, there is a small decrease in investment in one demand-oriented model ($13 billion) and an increase in the other ($45 billion). There is a major difference in the short term effects of decontrol on investment in the demand-side models when compared to the supply-side models. The supply-oriented model shows a large rapid increase in investment, the demand-oriented models do not. One shows a very slight increase, the other shows a large decrease. The analysis of accelerated/phased decontrol exhibits similar patterns (see Table 5).

2. Explanation of the Differences

It is easy to attribute the different behavior of labor and investment to the basic philosophy underlying the models. The supply-side model was premised on a transfer of wealth from consumers (labor) to producers (investors) which was assumed to be productive. The differences in results are consistent with this philosophy. In fact, this philosophical difference is embodied in a simple technical assumption made by the

Table 5

THE MACROECONOMIC EFFECTS OF PHASED DECONTROL DEPICTED IN TWO DIFFERENT MODELS 1/

(Change from Base)

	GNP (Percent)		Inflation (Percentage Points)		Labor		Investment (Percent)	
	H/J	D	H/J	D	H/J[2]	D[3]	H/J	D
1982	- .12	- .03	-	.2	.01	0.0	1.53	-
1983	- .22	-.23	-	.8	- .01	.1	2.40	-
1984	- .23	- .51	-	.8	- .01	.2	3.22	-
1985	.13	- .29	-	- .9	- .08	.2	.50	-
1986	.18	+ .19	-	- .7	- .07	0.0	.51	-
1987	.16	+ .22	-	- .1	- .07	- .1	.34	-
1988	.14	.04	-	.1	- .07	- .1	.22	-
1989	.15	0.0	-	0.0	- .07	0.0	.21	-
1990	.16	- .03	-	- .1	- .06	0.0	.17	-
Cumulative Impacts	Billions of Constant 1980 $		% Change		Job Losses (in thousands)		Billions of Constant 1980 $	
3 Year	-16.3	-22.5	na	1.8	10	300	31.6	na
9 Year	+13.1	-18.1	na	.1	430	300	41.4	na

Explanatory Notes:
1/ H/J = Hudson/Jorgenson; W = Wharton
2/ Measured as percent decrease in labor supply
3/ Measured as percentage point increase in unemployment

authors of the econometric models. The supply-side model does not allow a price-wage-price spiral to occur:

> Further, no price-wage-price spiral mechanism is included. This limits the process of adjustment and, hence, the overall price impact to that which is solely attributable to the change in gas policy. 14

The demand-oriented models do permit price-wage-price spirals:

> In WAIFM [Wharton Annual and Industry Forecasting Model], all cost changes are passed through to the final product prices immediately. Consumers must pay higher gas bills and face higher prices for other goods and services. These direct and indirect price effects are only part of the final price increase. Seeing their real income fall, workers demand higher wages. Wage increases, in turn, increase the costs of production and product prices in future periods, generating a wage-price spiral. 15

As the supply-side analysts noted, excluding the price-wage-price spiral dampens the projected inflationary impact. In fact, it does much more. It also dampens the negative impact of decontrol on GNP (technically speaking, the aggregate supply curve does not shift as much as it would with the spiral mechanism). More importantly, the exclusion of a price-wage-price spiral ensures that labor will suffer a real loss in income. That is, it is necessary to preclude the spiral mechanism in order to shift resources to investors.

The so-called demand-oriented models actually assume that, in the short term, wages do not keep up. That is why the initial reduction in real income occurs. The models also assume that, in reality, in the long run, wages do try to keep up with prices. The difference between the models comes down to whether or not labor will respond to the increase in prices (and producer revenues) by attempting to offset their losses through wage increases and how effective labor will be in so doing. The supply-side model assumes that labor will be totally unsuccessful, even in the long run. The demand-side models assume that labor will not be successful in the very short run, but will be largely successful in the long run.

There are certainly other points of difference between the models, but this one difference should account for the majority of the differences in their output.

One can genuinely question the meaningfulness of conducting any analysis without some price-wage-price mechanisms. Although the supply-side analysts assert that omitting a price-wage-price spiral isolates the impact of decontrol, in fact it tests the impact of decontrol in a world that does not exist. The analysis excluding the price-wage-price mechanism would, at best, be an interesting sensitivity case, but it should not be the base case for drawing policy conclusions.

What makes this approach even more troubling is that DOE does not hesitate to criticize the so-called demand-oriented models for being unrealistic, and it did not hesitate to alter basic features of the models to make them accord with its conception of reality. To some extent, the alterations were called for. The models assumed, incorrectly, that industrial users are at their optimum use of gas; the models, therefore, predict incorrect responses to decontrol. DOE properly alters the assumptions and changes the direction of the models' responses.

Shouldn't DOE have exercised its judgment and modified the supply-side assumption which contends there is no price-wage-price mechanism? Such an assumption is certainly no more realistic than the assumptions in the demand-side models which DOE criticized and changed. In other words, doesn't the supply-side model assume, incorrectly, that there is no price-wage-price spiral and, therefore, make incorrect predictions?

The net effect is to render the overall conclusions reached by DOE quite unrealistic. In particular the positive effects of decontrol predicted by the unrealistic supply-side model must be questioned.

III. CONCLUSION

Having analyzed and interpreted the output of DOE's econometric models and reconciled some of the differences between them, it is important to stress again that we do not necessarily agree with DOE's specification of the input to those models. The output of the Gas Market Model, which is imposed on the econometric models, will be discussed in subsequent papers in CECA/RF's series. As noted above, this output repeatedly errs on the side of extreme optimism with respect to the effects of decontrol. If the optimistic assumptions prove unrealistic, then the negative impact of decontrol predicted by the macroeconomic models would be even larger.

Notwithstanding this note of caution, the message of overwhelming importance in DOE's analysis is that even with its optimistic assumptions, the negative impacts of the supply-side approach are undeniable. Massive transfers of wealth will occur, with little increase in GNP, no increase in gas supplies, declining productivity in the overall economy, and losses in income by most groups in society that dwarf any gains in GNP. The theoretical argument is trickle down in nature; the analytic work suggests the policy would be trickle up in effect.

FOOTNOTES

[1] U.S. Department of Energy, Residential Energy Consumption Survey, Part I, National Data, April 1981, Table 1.

[2] U.S. Department of Energy, Monthly Energy Review, October 1981, pp. 23, 25. This percentage is based on the industrial sector direct consumption for all energy except electricity plus the indirect consumption of natural gas for electricity generation.

[3] U.S. Department of Energy, A Study of Alternatives to the Natural Gas Policy Act of 1977, November 1981; Two Market Analysis of Natural Gas Decontrol: Appendix A, November 1981; Macroeconomic Consequences of Natural Gas Decontrol, Appendix C, November 1981.

[4] U.S. DOE, Two Market Analysis.

[5] U.S. DOE, Macroeconomic Consequences

[6] Hudson/Jorgenson Associates, contractor for DOE's supply-oriented study, states the argument tersely for the case of natural gas price decontrol. In the natural gas case, household consumption goes down, while industry income (therefore savings and investment) goes up (U.S. DOE, Macroeconomic Consequences, I-24):

> Accelerated decontrol promotes an expansion in the productive capacity of the economy as real investment in all years is higher than in the Reference or present policy case. . . . All other things being equal, the change in capital supply increases the output and real income that the economy can achieve. Indeed, this rise in capital availability is the principal mechanism that reduces the earlier economic costs and secures the continuing economic benefit of accelerated natural gas price decontrol.
>
> In the 1982 to 1984 period, private savings and investment increase substantially. There is a substantial rise in gas-related capital income, i.e., income to gas suppliers. That is reflected in higher dividends from and retained earnings in these industries. The upward movement in prices also leads to some increase in other capital income and nominal rates of return. From each of these sources there is a rise in private income. Decontrol leads to higher energy prices, to higher costs and to higher output prices, raising the

average price of consumption goods and services. Households increase their consumption outlays but not by enough to offset the higher prices (there is a small reduction in real consumption).

[7] Ibid., p. III-19.

[8] U.S. DOE, A Study of Alternatives, p. 23.

[9] Ibid., p. 27.

[10] U.S. DOE, Macroeconomic Consequences, p. I-15.

[11] Ibid., p. I-iii.

[12] U.S. DOE, A Study of Alternatives, p. 30.

[13] U.S. DOE, Macroeconomic Consequences, p. I-iii.

[14] Ibid., p. I-18.

[15] Ibid., p. III-10.

THE PAST AS PROLOGUE I

THE UNDERESTIMATION OF PRICE INCREASES IN THE DECONTROL DEBATE:

A Comparison of Oil and Natural Gas

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CONSUMER ENERGY COUNCIL OF AMERICA

RESEARCH FOUNDATION

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CONTENTS

Page

Introduction 1

The Track Record of Oil Decontrol 2

Carter's Failure 3

Ford's Failure 6

Reagan's Failure 7

Natural Gas Price Projections 8

Price Increases and Economic Impacts 15

Summary and Conclusions 18

Footnotes 20

LIST OF ILLUSTRATIONS

Figure 1 4

Figure 2 9

Figure 3 10

THE PAST AS PROLOGUE I

THE UNDERESTIMATION OF PRICE INCREASES IN THE DECONTROL DEBATE:

A Comparison of Oil and Natural Gas

Introduction

One of the most critical issues in estimating the impact of energy price decontrol decisions is the projection of the magnitude of the price increase that will flow from each policy alternative. The size of the price increase determines the impact of decontrol on the economy and on the distribution of national wealth (equity). In other reports, the Consumer Energy Council of America Research Foundation (CECA/RF) analyzes the economic and equity impacts of rising energy prices. This report focuses on the issue of making realistic price projections. This must be the starting point for any impact analysis.

It should be noted at the outset that predicting energy price changes as a result of decontrol is an "iffy" business. Due to the fact that many unpredictable variables affect energy prices, projections typically have a wide margin of error. Moreover, matters are made worse by the fact that those who support decontrol of energy prices are likely to underestimate price increases; by the same token, those who oppose decontrol are likely to overestimate them. The combination of genuine uncertainty in the energy market and self-interested bias in much of the data makes it extremely difficult to sort out the good from the bad price projections.

Fortunately, however, we no longer have to approach energy price predictions in a vacuum. Over the past decade three different administrations have made energy decontrol decisions. There is a record of the predictions made prior to those decontrol decisions and the reality of the price increases that resulted from decontrol. By comparing the two, we can glean at least some idea of the magnitude of error in each set of predictions. Further, if the errors can be related to logical or systematic factors, our ability to predict future prices will be improved by analyzing and studying them. In particular, we can learn which assumptions appear to be most appropriate for making predictions.

In this report the Consumer Energy Council of America Research Foundation examines the track record of previous oil decontrol decisions and draws some implications for the analysis of natural gas decontrol.

The Track Record of Oil Decontrol

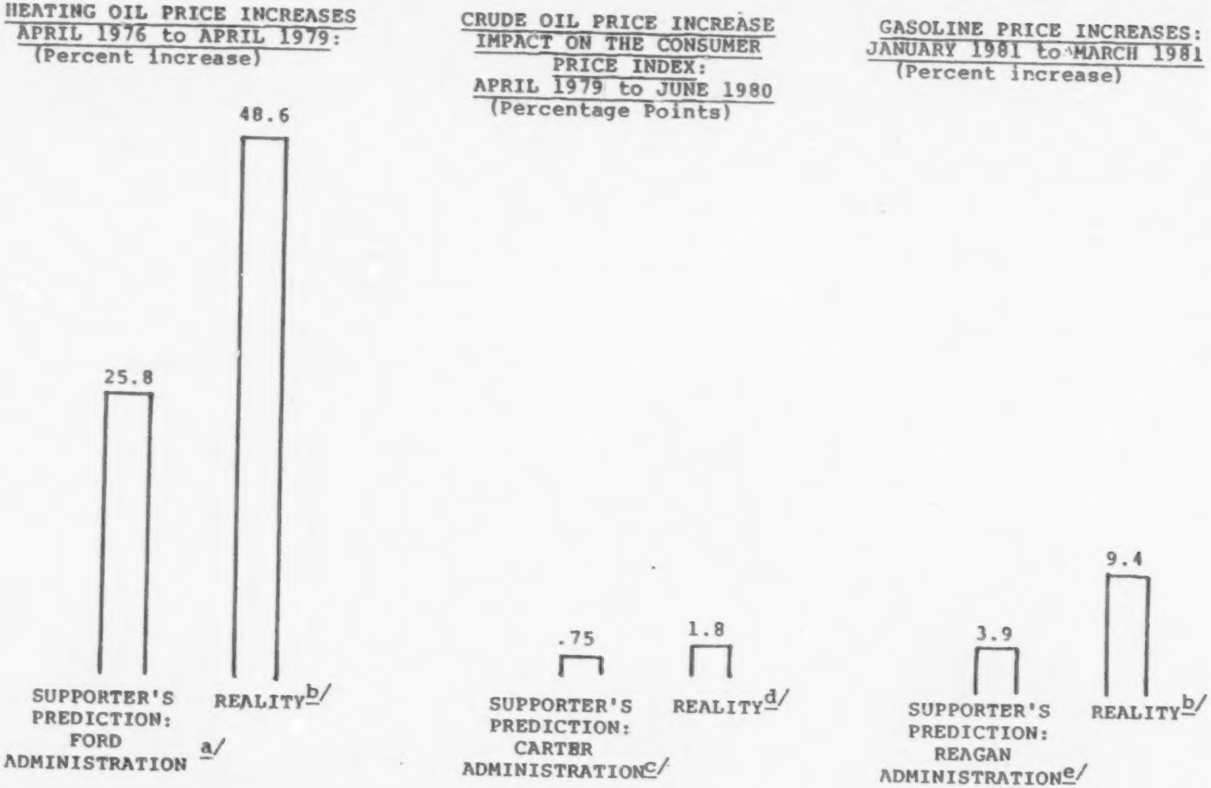
In 1976, the Ford Administration decontrolled heating oil prices. In 1979, the Carter Administration initiated the phased decontrol of crude oil prices. In 1981, the Reagan Administration finalized the decontrol of gasoline prices. (Actually, the Reagan Administration finalized the phase-in of crude oil price decontrol, but, since gasoline was the only controlled product at that time, in effect it decontrolled gasoline prices.) On each occasion a prediction was made about the price increase and/or the inflationary impact that would ensue. As Figure 1 shows, the record of those predictions is uniformly dismal. Predicted price increases were about one-half of the actual increases. Below CECA/RF examines the basis for the predictions and/or their errors in order to gain an important insight into energy pricing behavior.

Carter's Failure

The Carter Administration's failure to predict the impact of decontrol can be partly attributed to the erratic behavior of foreign oil prices, although one should not discount the role of domestic/ multinational oil corporations in paving the way for the supply shortage of 1979.[1] Nevertheless, a great deal of the rhetoric surrounding crude oil decontrol was that competitive pressures and the release of market forces would moderate price increases.[2] These forces certainly did not provide much price protection and one must question whether, in fact, they exist at all. However, because foreign oil prices were rising rapidly, the decontrol of crude oil under President Carter does not serve as a good test of whether market forces can moderate price increases in energy markets. On the two other occasions of oil decontrol, however, the errors in prediction cannot be attributed to foreign price increases.

FIGURE 1

COMPARING PREDICTED AND ACTUAL PRICE INCREASES ASSOCIATED WITH THE VARIOUS STAGES OF OIL DECONTROL



SOURCES: See following page

NOTES TO FIGURE 1

[a] Gorman Smith, "Hearings," Committee on Interstate and Foreign Commerce, H.R. Doc. No. 9121-131 (June 22, 1976), p. 38.

[b] MER, various issues.

[c] "Testimony of Charles L. Shultze, Chairman, Council of Economic Advisors, before the Joint Economic Committee, Subcommittee on Energy, U.S. Congress, April 25, 1979.

[d] Congressional Budget Office, letter from Alice M. Reinlin to Senator Edward M. Kennedy, "Impact of Enerlgy Prices and Inflation on American Families," hearings before the Subcommittee on Energy of the Joint Economic Committee, Congress of the United States, July 8, 1980.

[e] Wall Street Journal, "Decontrol of Oil Prices Expected Today," January 28, 1981.

Ford's Failure

The Ford Administration predicted that heating oil prices would go up by no more than the increase in the price of crude oil after they were decontrolled in May 1976.[3] That is, whatever happended to crude oil prices would happen to heating oil prices as well. Here there can be no question of external price shocks. The argument put forward at the time was that competition would prevent heating oil producers/distributors from raising prices higher than the increase in crude oil costs. The Administration contended that distributors of heating oil would compete both with one another and with alternative fuels to preserve and expand their markets. Therefore, they would put pressure on producers to hold the price of heating oil down. In fact, the oil industry found some way to create price increases twice as large as the crude oil increases.[4]

Analyses of the increases in heating oil prices in excess of the increase in crude prices show that between one-fifth and three-quarters of the increment was due to something other than increases in production or operating costs.[5] In other words, there appeared to be increases in profit margins. Thus, competitive pressures had once again failed to keep prices down. On the contrary, decontrol in the absence of competitive pressures seems to have enabled producers and refiners to increase their profits.

Reagan's Failure

In January 1981, the Reagan Administration finalized the decontrol of gasoline with the assurance that gasoline prices would rise, at most, by five cents a gallon.[6] The administration contended that competition at the pump would keep prices down. However, within less than two months, the actual price increase was more than double that amount.[7] Nothing unusual was going on in the world oil market at that moment -- in fact, prices were declining slightly and there were no regulations to blame, since oil was now completely decontrolled. Yet, prices went up by more than 12 cents a gallon.

Here it is important to address a myth that has grown up around the Reagan gasoline decontrol action of January 1981. The supporters of decontrol are fond of pointing out that after gasoline prices peaked in March 1981, they declined by 2.2 percent through October. A great victory for decontrol is claimed. The claim does not stand even a modest degree of scrutiny.

First, between May 1979, the month before decontrol of crude oil began, and March 1981, when gasoline prices "peaked," prices had risen by 60 cents a gallon (from $.791/gallon to $1.388/gallon). It is hardly a major victory if prices then drop by 3.5 cents or about one twentieth of the increase of the previous two years. Market forces cannot be very strong if it takes a near doubling of prices to get them to move downward a fraction.

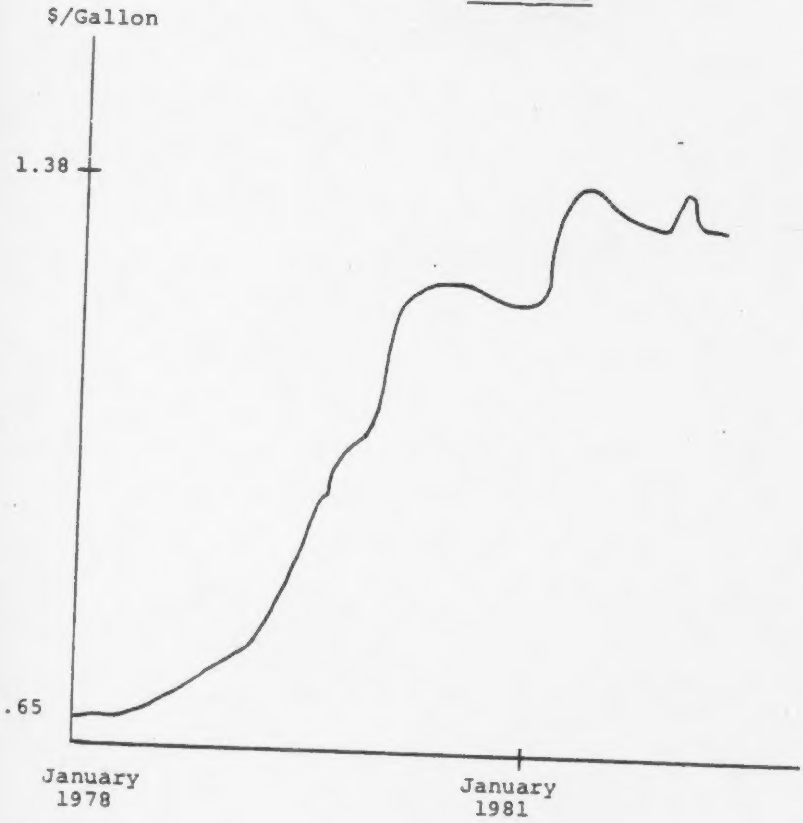
Second, the fall in prices observed in 1981 seems to have been totally unrelated to decontrol. The year before Reagan's decontrol action, gasoline prices fell by 2 percent from their peak in July 1980 to their floor in November 1980 (see Figure 2). In fact, prices had been quite stable throughout the latter part of 1980, prior to Reagan decontrol. The Reagan decontrol action seems to have enabled gasoline prices to jump 12 cents, then follow their usual pattern of seasonal moderation. A careful look at the history of gasoline prices shows that in 1975, 1976, 1977, 1980 and 1981 there was a decline in gasoline prices -- ranging from 1 to 3 percent -- between their peak in the summer and their valley in the following winter.[8] The pattern appears to be seasonal rather than being related to decontrol. Thus, the victory that is claimed for decontrol is an illusion.

It appears that both Republican and Democratic administrations had seriously overestimated the strength of competitive and market forces and seriously underestimated the ability of the domestic energy industry to impose price increases in excess of what a competitive situation would have allowed.

Natural Gas Price Projections

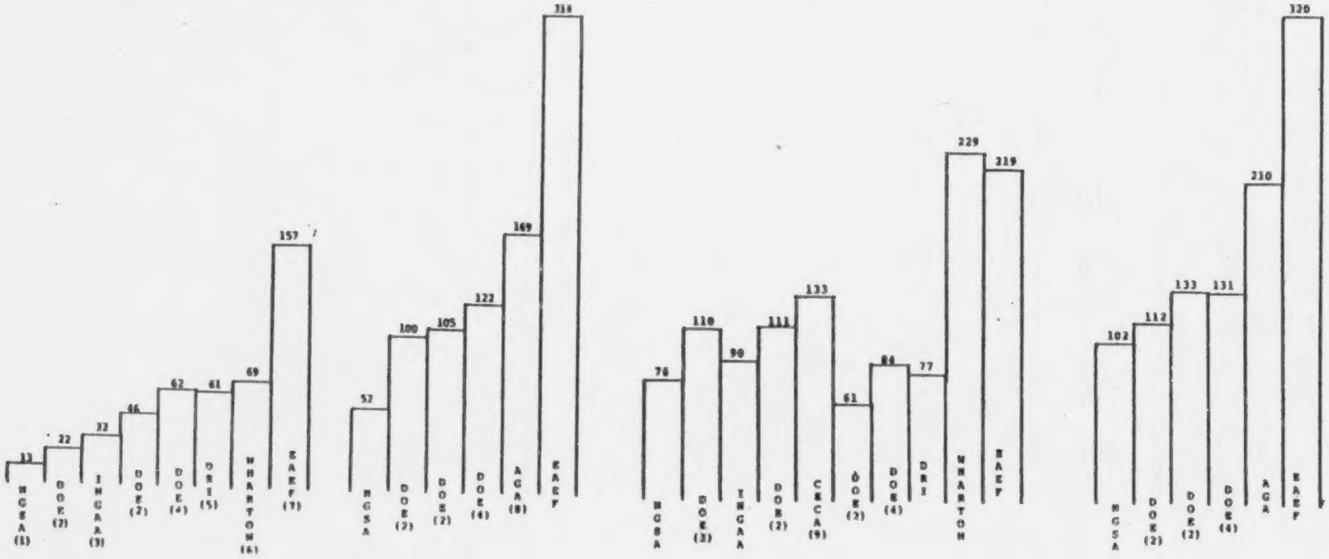
Against this track record, the current flurry of predictions about natural gas decontrol is most interesting. Figure 3 presents a number of recent projections of the

FIGURE 2
GASOLINE PRICES
1978-1981



SOURCE:
U.S. Department of Energy, Monthly Energy Review, various issues.

FIGURE 3
PRICE INCREASES PROJECTED AS A RESULT OF NATURAL GAS DECONTROL



PERCENTAGE REAL PRICE INCREASE IN THE FIRST YEAR AFTER DECONTROL

ACCELERATED DECONTROL

FULL DECONTROL

PERCENTAGE REAL PRICE INCREASE IN THE FIRST THREE YEARS AFTER DECONTROL

ACCELERATED DECONTROL

FULL DECONTROL

SOURCES:
See following page

NOTES TO FIGURE 3

[1] Glenn C. Loury, An Analysis of the Efficiency and Inflationary Impact of the Decontrol of Natural Gas Prices, (Natural Gas Supply Association [NGSA], April 1981). Full decontrol is Scenario 4. Accelerated decontrol is Senario 6. The latter is tantamount to a four year phase-in.

[2] U.S. Department of Energy, Two Market Analysis of Natural Gas Decontrol, Attachment 3, November 1981.

[3] Interstate Natural Gas Association of America, Analysis of Natural Gas Decontrol, December 1, 1981. Case J, which is the scenario preferred by INGAA (see Supplemental Statement on Behalf of the Interstate Natural Gas Association of America, Senate Committee on Energy and Natural Resources on the Implementation of Title I of the Natural Gas Policy Act, December 1, 1981).

[4] U.S. Department of Energy, Reducing U.S. Oil Vulnerability: Energy Policy for the 1980's (November 10, 1980), Chapter II.

[5] Mary H. Novak, "Natural Gas: Should the NGPA Be Reopened," Data Resources Inc., Spring 1981, Decontrol-1982 Scenario.

[6] Wharton Econometric Forcasting Associates, cited in Dun's Business Month, November 1981, p. 56.

[7] Energy Action Educational Foundation, The Decontrol of Natural Gas Prices: A Price American's Can't Afford (February 19, 1981).

[8] The American Gas Association, Cost of Immediate Total Wellhead Price Decontrol of Natural Gas to Low Income and Disadvantaged Groups, April 9, 1981.

[9] See Appendix A.

increase in average wellhead prices in the first year and the first three years following both accelerated decontrol and full decontrol. The range of estimates is extremely wide. The highest estimate for the first year increase under an accelerated decontrol scenario is more than ten times as large as the lowest. For full decontrol, the highest estimate of the first year increase is six times as large as the lowest. Estimates of the three year increases do not vary as widely. The highest estimated increase for accelerated decontrol is 3.7 times that of the lowest, while under full decontrol the highest estimate is 3.6 times the lowest.

Full decontrol and the three year accelerated decontrol estimates are probably better gauges of the differences of opinion about likely price increases than the estimates after just one year of accelerated decontrol. This is the case because the various accelerated decontrol scenarios which CECA/RF has reviewed are based on somewhat different assumptions about which categories of gas will be decontrolled and what the pace of decontrol will be. However, the accelerated scenarios begin to converge in the third year in terms of the quantities of gas decontrolled and the ceiling prices allowed, so that these price estimates are based on roughly comparable conditions.

As Figure 3 shows, supporters of decontrol (for example, the Natural Gas Supply Association [NGSA] and the Reagan Administration) project price increases that are one-half to one-third those of opponents of decontrol (the American Gas Association [AGA] and Energy Action Educational Foundation [EAEF]). Here the experience of prior oil and oil product decontrol actions is most instructive. Actual price increases generally have been 2 to 2> times larger than the price increases predicted by the various supporters of decontrol. Thus, based on recent history and the pattern of projections, it is a safe bet to assume that actual price increases will fall midway between the high and low estimates.

Splitting the difference is not simply a numbers game. Differences in price projections need not stem from blatant biases or erroneous calculations. In fact, it is easy to construct technically correct explanations for each set of predictions, i.e., explanations whose reasoning is correct, once their assumptions are granted.

Those who project low price estimates tend to assume 1) intense competition between suppliers leading to relatively elastic supply and 2) significant discretionary use of energy or easy substitution of capital for energy or easy switching between fuels, leading to relatively elastic demand. In short, there is an assumption that competitive market forces on both the supply and demand sides would keep prices down.

Those who project high price estimates tend to assume 1) much less competition between suppliers and 2) much less elasticity of demand. Simply put, there is an assumption that competitive market forces are weak and prices could run up sharply after decontrol.

In Appendix A, CECA/RF develops a detailed example of the behavior of the natural gas market under assumptions of restricted competition and inelastic demand based on the most recent analysis of the natural gas market developed by the Department of Energy.[9] The CECA/RF analysis shows that altering DOE's assumptions about competition and demand elasticity can lead to a predicted price of gas 15 percent higher than DOE's estimates in Figure 3. That would put the estimate of price increases close to twice as high as NGSA's.

For present purposes, let it suffice to say that one approach to take in resolving a difference of opinion about the state of competition in the market would be to observe the market in order to ascertain which set of assumptions best fits reality. Economists are fond of identifying those characteristics of the market which theoretically determine the level of competition (e.g., concentration ratios) and then calculating them for each energy market. However, prior research in this regard has not been conclusive. Another, more direct and empirical approach is to look at the history of price behavior subsequent to recent decontrol decisions. Rather than rely on some theoretical notion of what the market should do, CECA/RF charts what it has actually done in the recent past. Past predictions, which assumed highly competitive conditions, have been off by a factor of two.

And they are likely to be off in the future -- also by a factor of two.

Price Increases and Economic Impacts

As mentioned in the introduction, the concern over the magnitude of price increases has two points of real significance. That is, there are two major reasons why we worry so much about price increases. One reason involves the equity of price increases. When prices go up -- especially on domestically produced commodities -- some Americans lose and some gain. The higher the increases, the bigger the losses. The second reason involves the impact of price increases on general economic activity. When prices go up, economic activity tends to be reduced. If price projections are off by a factor of two, the estimation of impacts will be off as well. Each of these issues will be dealt with in separate reports by CECA/RF.[10] However, in the context of the history of price projections and price realities one important observation can be offered at this point that deals with the linkage between price increases and economic impacts.

One of the arguments being made in support of accelerated decontrol of natural gas is that it will avoid a "price shock" and therefore moderate the economic impact of rising prices. The severe disruptions associated with the oil price shock of 1979-80 are frequently the point of reference. That is, those who support phased accelerated decontrol think they can avoid a price shock similar to that of 1979-80, which occurred for oil. If that is the frame of reference, then the argument that accelerated decontrol of natural gas will cushion the economic blow is largely unfounded.

The pattern of price increases that will occur under accelerated phased decontrol of natural gas is very similar to the pattern of price increases that actually occurred during 1979-81. Although the causes of the crude oil price increases in 1979-80 are different than the causes of the projected natural gas price increases, the actual patterns of increases and their likely economic effects are similar and this is a point of overwhelming importance. Let us review each pattern of price increases in turn.

The oil price shock is commonly associated with an event, the Iranian revolution, and a subsequent rapid increase in crude oil prices. From the point of view of the domestic economy, however, this conception is completely wrong. For six months after the Iranian shutdown of January 1979, 70 percent of all domestic crude oil was under price controls.[11] In June 1979, the phased decontrol of domestic oil began. The net effect was not that crude oil prices jumped instantaneously; rather, they rose in a rapid, but steady fashion. There was no single price shock; there was a phased run-up in prices.[12] Specifically, between January 1979 and October 1981, refiner acquisition costs for crude oil increased from about $2.26 per million Btu ($13.11/bbl) to $6.02 per million Btu ($34.93/bbl). The average monthly increase (compounded) was 3.3 percent. The actual month by month increases in prices were fairly even -- the average increase was 3.7 percent per month and 17 of the 29 monthly changes represented increases of between 2.1 percent and 7.2 percent. This is the price pattern that produced the negative economic impacts associated with the oil price shock.

Now let us contrast that historical record with the price trajectories projected for accelerated decontrol of natural gas. The price trajectory of natural gas decontrol will reflect two factors. Some gas will be decontrolled immediately (the most frequently discussed categories are all gas discovered after January 1, 1982 (referred to as "new-new gas") or all gas discovered after January 1, 1977 (referred to as "all new gas"). The remainder of the gas (referred to as "old gas") will be decontrolled in a phased fashion over a period of between 24 and 60 months, depending on which scenario is chosen and which categories are included.

According to the high and low estimates presented in Figure 3, the price trajectory that would result from decontrol is as follows: natural gas prices would go from about $2.30 per million Btus in January 1982 to a price between $7.00 and $8.50 per million Btus in January 1986. The average monthly price increases (compounded) would be between 2 and 3.3 percent. There would be a surge in the first year when monthly price increases would be between 3 and 4.2 percent (compounded). The highest price projection leads to a rate of increase in gas prices that is about 18 percent faster than that which occurred for oil. The low price projection leads to a rate of increase that is roughly 32 percent slower than the increase for oil. If reality falls between the two, one would expect a pattern of price increases that is quite close to that which occurred during the oil price shock. Such a pattern would mean that prices would increase at exactly the rate which occurred during the oil price shock.

To the extent that energy price increases present problems of structural adjustment in the economy (as opposed to simple surprises for which the economy is unprepared), not much relief can be expected from accelerated decontrol. Those structural problems and the magnitude of the impact of price increase will be the topic of another report in this series, but it is clear that the supporters of decontrol are mistaken if they believe that phased decontrol will cushion the blow.

Summary and Conclusions

In this report we have examined the history of price projections and the price realities that surround energy price decontrol decisions. We have found that, in the case of oil-related decontrol, the supporters grossly underestimated the increase in prices that occurred. Insofar as they repeatedly argued that competition would hold prices down, their dismal record of price projections suggests that competitive and market forces are weak.

Turning to the current projections of the impact of natural gas decontrol, we find a wide difference of opinion. The supporters of decontrol predict price increases one-third that of the opponents. If history is a guide, one can expect that the actual price increases will be twice as large as those predicted by the supporters.

Finally, we have examined the pattern of price increases that occurred during the "oil price shock" of 1979-80. We find the accelerated phased decontrol of natural gas will create a trajectory of price increases that is quite similar to that which occurred during the oil price shock. This clearly suggests that phasing-in decontrol will not avoid the severe negative economic impacts of rising energy prices that occurred during the oil price shock.

FOOTNOTES

[1] Official accounts absolve the major oil companies of all responsibility (see, for example, The Report of the Department of Justice to the President Covering the Gas Shortage of 1979 [Washington, DC: Goverment Printing Office, July 1980]) but there is ample evidence of their involvement (see Roots, Realities, Responsibilities: How the Major Oil Companies, Not OPEC, Tightened Oil Supplies and Initiated Price Hikes in 1978 and 1979 [Energy Action Educational Foundation, May 1980]).

[2] See, for example, "Testimony of Charles L. Shultze, Chairman, Council of Economic Advisors," before the Joint Economic Committee, Subcommittee on Energy, U.S. Congress, April 25, 1979.

[3] See, for example, testimony of Gorman Smith, before the U.S. Congress, Committee on Interstate and Foreign Commerce, H.R. Doc. No. 914-131 (June 22, 29, 1976), p. 38.

[4] U.S. Department of Energy (DOE), Monthly Energy Review, various issues.

[5] The lower estimate can be derived from DOE, Analysis of Refiner No. 2 Distillate Costs and Revenues, July 1976-June 1979, Tables 9 and 19 (September 1979). The higher estimate can be derived from the Consumer Energy Council of America, "Analysis of No. 2 Distillate Prices and Margins," presented before the U. S. Congress, House, Subcommittee on Environment, Energy and Natural Resources of the Government Operations Committee, February 12, 1980.

[6] See the comments of David Stockman, in "Decontrol of Oil Prices Expected Today," Wall Street Journal, January 28, 1981. Some industry analysts asserted that "we would be hesitant to sock on a 10-cent-a-gallon increase at once, the increase could come in stages at a rate a couple of cents a month." Others professed to believe that "almost nothing" would happen due to ample stocks which would face refiners' margins to shrink.

[7] MER, various issues.

[8] Ibid., various issues.

[9] U.S. Department of Energy, Two-Market Analysis of Natural Gas Decontrol (Washington, DC: Government Printing Office, November 1981).

[10] CECA/RF, "Natural Gas Price Deregulation: A Case of Trickle Up Economics" (January 20, 1982).

[11] The Congressional Budget Office, The Decontrol of Domestic Oil Prices: An Overview, May 1979, Chapter II.

[12] MER, various issues.

Appendix A

COMPETITIVE VERSUS OLIGOPOLY PRICING OF NATURAL GAS

or

How Big Does the Tail Have To Be To Wag the Dog?

an appendix to

The Past as Prologue I
The Underestimation of Price Increases in the Decontrol Debate

Prepared by:

CONSUMER ENERGY COUNCIL OF AMERICA
RESEARCH FOUNDATION

February 18, 1982

TABLE OF CONTENTS

Page

A. Introduction 1

B. Competition vs. Non Competition 3

C. The DOE Assumptions 6

  1. The Basic Approach 6
  2. The Theoretical Market Clearing Price 7

D. An Estimation of the Theoretical Market Clearing Price Under Competition 11

  1. The Demand Curve 11
  2. The Supply Curve 13
  3. The Market at Equilibrium 23

E. The Oligopoly Solution 27

F. Alternative Assumptions About Residential/Commercial Sector Demand 32

G. Summary and Conclusion 34

FOOTNOTES 37

LIST OF TABLES

Page

Table A.1
Percentage Distribution of Natural Gas Demand 9

Table A.2
The Competitive Wellhead Price of Natural Gas for Each User Category/Alternative Fuel Combination 12

Table A.3
Estimating Implicit Rates of Return for Various Categories of Natural Gas 18

Table A.4
Implicit Supply Elasticities in the Aggregate Natural Gas Market 24

Table A.5
Implicit Demand Elasticities in the Aggregate Natural Gas Market 26

LIST OF ILLUSTRATIONS

Page

Figure A.1
Price and Supply Under Assumptions of Competition and Monopoly 4

Figure A.2
Price Under Assumptions of Competitive and Oligopoly Behavior 5

Figure A.3
Maximum Potential Natural Gas Demand Curve 14

Figure A.4
The Department of Energy's Conceptual Demand Curve 15

Figure A.5
Marginal Cost Curve for Natural Gas 16

Figure A.6
An Estimated Supply Function for Crude Oil 21

Figure A.7
The Department of Energy's Conceptual Supply Curve 22

Figure A.8
The Oligopoly Price Compared to the Competitive Market Price 28

Figure A.9
The Oligopoly Price with Smoothed Demand Curves 30

Figure A.10
The Oligopoly Price with High Marginal Costs 31

Figure A.11
The Oligopoly Price with Conversion Costs in the Residential/Commercial Sectors 35

APPENDIX A

COMPETITIVE VERSUS OLIGOPOLY PRICING OF NATURAL GAS

or

How Big Does the Tail Have To Be To Wag the Dog?

A. Introduction

The review of the recent history of the behavior of energy prices presented above has shown that history has been extremely unkind to those who assume that energy markets are highly competitive. Actual price increases have far outstripped their predictions, calling into question the soundness of the competition assumption. The review of natural gas decontrol price projections presented in "Past as Prologue I" has shown wide differences and we have suggested that these differences in price projections can be explained logically by differences in assumptions with respect to the extent of competition in the market. In this Appendix, we demonstrate that differences in assumptions can be translated empirically into differences in price projections.

Unfortunately, few of those who actually make the projections bother to present and defend their assumptions or to analyze what the impact of alternative assumptions would be. Above all, because price predictions tend to be highly political, most of those who make them are not at all inclined even to consider alternative assumptions that touch on matters as basic as competition. Moreover, most studies do not contain an adequate basis for undertaking such analyses. Thus, most studies simply state their assumptions and derive their conclusions without gathering evidence or demonstrating that supply and demand (either competitively or non-competitively) will reach equilibrium at the particular price they believe is correct.

The recent study by the Department of Energy[1] does have the necessary elements for considering alternative assumptions about competition, although DOE did not conduct such an analysis. In fact, DOE assumes a level of competition that is identical to the assumptions made by the gas producing industry and never questions these assumptions. Because the DOE study is likely to be of considerable importance in present and future decontrol debates, because it is one of the few with the necessary analytic elements, because DOE has blindly assumed competition, because recent price history has suggested an absence of competition, and because we believe that there is a considerable body of evidence to justify some skepticism of the assumption of a high degree of competition in the natural gas market,[2] this technical appendix compares the expected price under the assumptions of competition to the expected price under the asssumption of non-competition in the market.

B. Competition vs. Non Competition

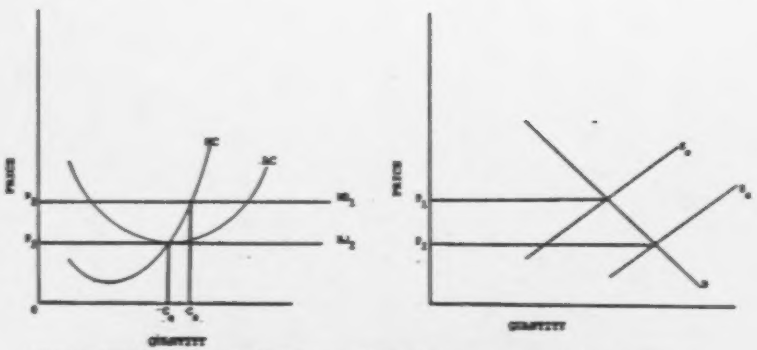
The basic tools needed to analyze pricing behavior under assumptions of a lack of competition can be found in the most elementary of economics texts. Figures A.1 and A.2 provide two simple discussions of why monopoly or oligopoly market conditions lead to lower quantities supplied and higher prices than competitive conditions. For those unfamiliar with the basic concepts, a careful reading of the explanations accompanying the figures will be helpful.

The essence of the argument rests on the demand curve which individual suppliers face. In a competitive situation, each supplier faces perfectly elastic demand and marginal revenue curves, since if the supplier raises prices above the market price, the supplier would lose his/her business to his/her competitors. Monopolists or oligopolists do not face perfectly inelastic demand curves. As they raise their prices, they lose only part of their business; since fewer competitors threaten their demand, their loss of demand is relatively small. They are willing to lose demand, as long as they increase profits by doing so. That is, they keep raising prices, even though they are losing business, because they make more profits by selling less at higher prices. In fact, all suppliers maximize profits at the point where marginal revenue equals marginal cost; but oligopolists maximize profits at higher prices and lower quantities supplied than those who face competition because they face a less than perfectly elastic (i.e., downwardly sloping) demand

FIGURE A.1

PRICE AND SUPPLY UNDER ASSUMPTIONS OF COMETITION AND MONOPOLY

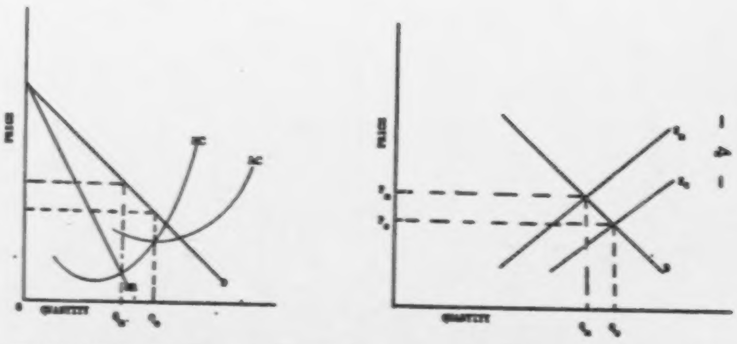
COMPETITION AND EFFICIENCY



At the market price of P_1, the firm chooses a level of output, C_1, where MR = MC. Since P is above AC, profits are earned. Entry occurs, pushing the market supply curve out to the right, and market price decreases. When market price falls to P_2, entry will cease. For the firm, MR = MC at C_2 (so profits are "maximized," the firm does the best it can given the circumstances); and there are no profits, since AC=P! The cost per unit produced is equal to the price the firm gets per unit sold. Revenues just cover costs. However, remember that costs include opportunity costs for the firm! Even though no economic profits are earned at this level of output, the firm still gets enough revenue to cover its opportunity costs (normal profits). So the firm will remain in business. But note what has happened. Due to competition and free entry, the firm has been forced to produce at that level of output that minimizes average cost!

Source: Tom Riddell, Steve Stamos and Jean Shackleford, Economics: A Tool for Understanding Society (Reading Mass.: Addison Wesley, 1979) pp. 157, 177-178.

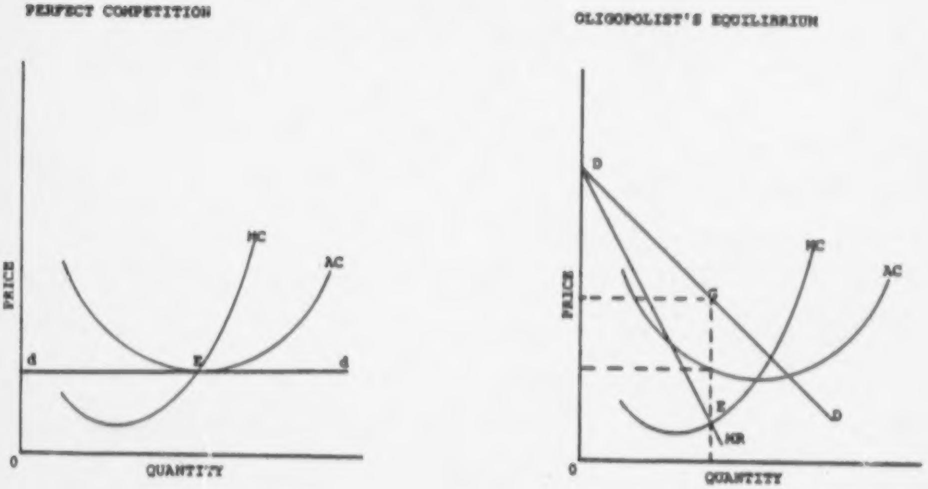
MONOPOLY OUTPUT RESTRICTION AND HIGH PRICE



What level of output will the monopoly choose to produce? It will produce Q_m, where MC = MR, because that level of output maximizes its profits. It will charge a price of P_m for that amount of output, because that is the price the market is willing to pay for that quantity. The monopoly is earning profits since P is well above AC. And the monopoly is producing at a rate of output that does not minimize average costs (Q_c is where AC is at a minimum). However, in a monopoly, when profits are being earned, there is no entry into the market, because there are no competitors. We can examine the theoretical results of this by focusing on the (aggregate market). If there were competition in the market, new firms would enter, market supply would increase to S_c, and market price would decrease to P_c. Thus, monopoly restricts output, since $Q_m < Q_c$. And monopoly charges higher prices, since $P_m > P_c$. Finally, monopolies earn monopoly profits. An important conclusion that can be drawn from the monopoly model is that the existence of market power (ability to control supply and price) tends to prevent the occurrence of consumer sovereignty, the attainment of economic efficiency, and the operation of the invisible hand. The monopoly benefits at the expense of the society.

FIGURE A.2

PRICE UNDER ASSUMPTIONS OF COMPETITIVE AND OLIGOPOLY BEHAVIOR



SAMUELSON OFFERS THE FOLLOWING DISCUSSION OF THE TWO SITUATIONS:[a/]

> This typical perfect competitor is one of so many producers of an identical good that he/she faces a practically horizontal (infinitely elastic) demand (dd) curve, even though the industry's very much larger DD curve can be much more inelastic. If there is free entry and exit of well-informed firms who can replicate the cost conditions of any other firm, long-run equilibrium at E will involve no excess of profit over competitive costs (including properly computed implicit opportunity cost returns). Society is getting its total output most efficiently, in recognition of the P=MC condition, both in long and short runs. It is not forcing out of existing firms any output that could be obtained more cheaply by adding new firms.

> After experience with disastrous price wars, each of the few rivals that dominate a given market is almost sure to recognise that price cutting begets cancelling-out price cutting. So the typical oligopolist will estimate his/her demand curve DD by assuming others will be charging similar prices (and by taking into account the potential entry of other oligopolists). Since he/she gains little from extreme cutting of P, he/she will settle for sizable markup of P over MC.

[a] Paul Samuelson, Economics (New York: McGraw Hill, 1980), pp. 482, 485.

curve. This basic concept underlies all discussions of pricing under non-competitive conditions.

Thus, in order to estimate natural gas prices under either competitive or non-competitive assumptions, we must estimate the supply, marginal cost, demand, and marginal revenue curves.

C. The DOE Assumptions

1. The Basic Approach

The Department of Energy and the gas producing industry assume a partially competitive market. They assume that a price ceiling on natural gas is set by some alternative fuel. That is, they assume there exists a price above which suppliers of alternative forms of energy (e.g., oil) will be able to steal business from gas producers. Therefore, competition between fuels restrains the price increases of natural gas and sets the market clearing price.

If we assume a ceiling price on gas which is set by competition with oil we can establish a demand curve for gas. When the demand curve is coupled with a supply curve, we can analyze what the market price of gas would be under different assumptions about the pricing behavior of suppliers.

However, it should be noted that the market assumed by DOE is not a perfectly competitive market in the classic sense. DOE does not assume that suppliers of gas can exert significant downward pressure on the price of alternative fuels. That is, gas producers do not steal sufficient oil business by producing more gas at lower prices to force the oil suppliers to lower their prices. The fact that gas suppliers do not try to exert downward pressure on oil prices suggests that perfect competition is not present. This creates the possibility of extremely high profits on natural gas production because natural gas prices need not bear any relationship to the costs of producing natural gas. That is, entry into the energy industry does not occur to wipe out abnormal profits (see Figure A.1 above). Instead of the average price of all forms of energy being driven down to a point where only normal profits exist, DOE assumes that the price of gas rises and yields abnormal profits. In fact, as will be discussed below, DOE's analysis suggests that extremely high rates of profit exist on gas production. These rates of profit would not exist in a perfectly competitive world.

2. The Theoretical Market Clearing Price

The Department of Energy and the gas production industry both assume a partially competitive environment in which the price of gas at the wellhead is set by the cheapest competing fuel. The cheapest competing fuel is assumed to be high sulfur (#6) residual fuel oil used primarily in industrial boilers (including electric utility power plants). Consumers of #6 oil are assumed to set the marginal price both because that fuel is cheapest and because these industrial consumers tend to have the capacity to shift between fuels in the short term. At a minimum, they have adequate incentive to acquire that capacity, thereby threatening to switch fuels if the given price is not competitive. That is, they can or are willing to acquire the ability to burn either fuel at any moment. Therefore, they "play" the energy market to minimize costs.

They install dual fuel-burning capacity partly because they have been low priority "interruptible" users in the past (and have needed dual capacity in order to maintain production operations) and partly because they consume enough energy to make playing the energy market economically justifiable. That is, the volumes of energy they consume are so large that they can cover the costs (including normal profits) of installing dual fuel-burning equipment.

DOE assumes that the wellhead price of natural gas will be equal to the burner tip price of #6 fuel oil minus gas transmission and distribution costs. That is, the price of gas at the wellhead can be no higher than the price of the alternative at the burner tip net of the transmission and distribution costs, i.e., the costs of getting the gas from the wellhead to the burner tip. Recent estimates by DOE show that consumers of high sulfur #6 oil who are potential gas consumers account for less than 4 percent of the aggregate demand for gas (Residual D in Table A.1). However, because they are the marginal users in a competitive framework, they set the wellhead price.

Table A.1

PERCENTAGE DISTRUBTION OF NATURAL GAS DEMAND

Category and Alternative Fuel Type

Alternative Fuel	Residential		Commercial		Industrial Non-Boiler		Electric Utilities		Industrial Boiler		TOTAL[1]
	Inter-state	Intra-state	Inter-state	Intra-state	Inter-state	Intra-state	Inter-state	Intra-state	Inter-state	Intra-state	
Distillate	25.9	3.4	7.3	1.4	3.3	1.5	2.4	.8	.2	1.3	46.5
Residual A	0	0	3.3	.7	10.1	4.9	.7	.2	1.4	2.0	23.3
Residual B	0	0	3.3	.7	1.5	2.6	.9	8.4	.6	1.2	19.2
Residual C	0	0	0	0	1.0	.7	1.3	.2	1.0	1.4	5.6
Residual D	0	0	0	0	.3	.1	.6	.1	1.1	1.4	3.6
Residential ($2.00)	0	0	0	0	.3	.2	.6	.1	.4	.6	2.2

---

[1] Numbers may not add due to rounding.

Source: DOE, Two Market Analysis, p. A-88.

According to DOE, once the wellhead price is set at the margin by these consumers, then the burner tip price can be calculated for all other consumers. This is accomplished by taking the wellhead price and adding to it the transmission and distribution costs that apply to each user. In other words, the entire market is driven by competition at the margin for high sulfur fuel oil users.

If one questions the assumption that suppliers behave as though they were driven by competition to sell every cubic foot of gas that they can, then one must question whether high sulfur residual fuel oil should drive the wellhead price. Such a small percentage of demand may look like a very small tail to be wagging a big dog. Wouldn't producers be willing to lose 4 percent of their demand by raising their price, if the increased price would lead to an increase in total profits?

As we shall see, DOE's evidence suggests that, if producers behave in a non-competitive fashion, they can maximize profits by raising prices well above DOE's theoretical competitive market clearing price and sacrificing as much as 30 percent of the total demand.

The following analysis estimates the demand, marginal revenue and marginal cost curves projected for 1985 based on DOE's recent analysis of accelerated/phased decontrol. Because the data are taken directly from published DOE materials, the analysis embodies DOE's assumptions and relies on considerable interpolation of DOE's results. Nevertheless, it makes the point quite clearly.

D. An Estimation of the Theoretical Market Clearing Price under Competition

1. The Demand Curve

In order to create the demand curve for natural gas, we begin by identifying the quantity of gas demanded by a series of specific categories of users (see Table A.1 above). User categories are identified by (1) the end use to which the fuel is put (residential, commercial, industrial non-boiler, industrial boiler and electric utility), (2) the pipeline market (interstate versus intrastate) and (3) the alternative fuel (distillate, 4 grades of residual oil and the lowest grade [highest sulfur] residual minus $2.00). There are 44 combinations of end uses/pipeline markets/alternative fuels and these are used as data points for the estimation of the demand curve. End use type, pipeline market and alternative fuel are chosen to define the categories of users because they are the most critical determinants of the wellhead price of natural gas that would compete with alternatives at the burner tip.

In the next step, we calculate the wellhead natural gas price that would just capture the business of each user category. That is, we create a second matrix by calculating the burner tip price of the alternative fuel minus the transmission and distribution costs implicit in DOE's analysis for each specific user category (see Table A.2).

Table A.2

The Competitive Wellhead Price of Natural Gas for Each User Category/Alternative Fuel Combination

Alternative Fuel	Transmission & Distribution Costs	Residential		Commercial		Industrial Non-Boiler		Electric Utilities		Industrial Boilers	
		Inter-State	Intra-State	Inter-State	Intra-State	Inter-State	Intra-State	Inter-State	Intra-State	Inter-State	Intra-State
Distillate	7.13	5.08	5.79	5.36	6.10	6.00	6.69	5.95	6.77	6.16	6.16
Residual A	6.17	na	na	4.40	6.14	5.04	5.73	4.99	5.81	5.20	5.20
Residual B	5.71	na	na	3.94	4.68	4.58	5.27	4.53	5.35	4.74	4.74
Residual C	5.55	na	na	na	na	4.42	5.11	4.37	5.19	4.58	4.58
Residual D	5.36	na	na	na	na	4.23	4.92	4.18	5.00	4.39	4.39
Residual D minus $2.00	3.36	na	na	na	na	2.25	2.92	2.18	2.00	2.39	2.39

Source: DOE, Two Market Analysis, Attachment IV.

The burner tip price of the alternative fuel minus transmission and distribution costs equals the wellhead price that would be just competitive with the alternative.

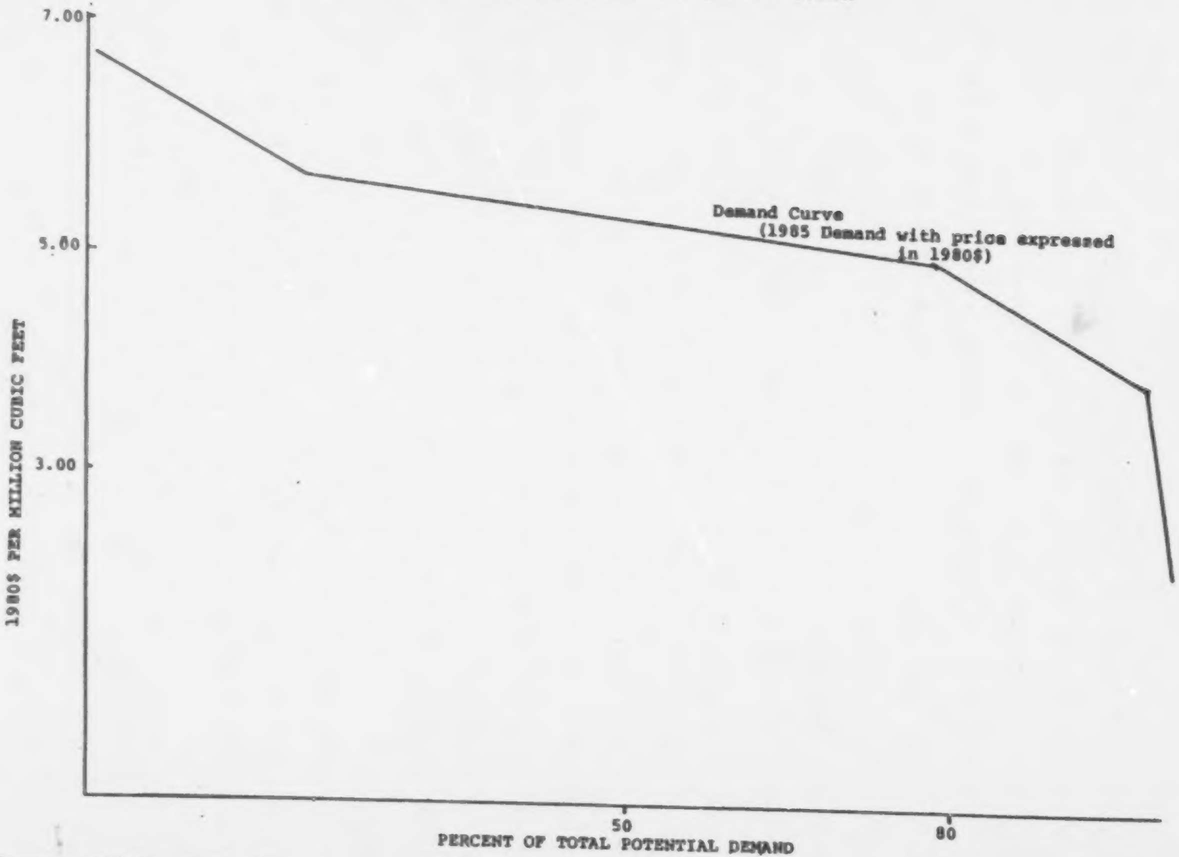
The demand curve that results (see Figure A.3) exhibits a shape that is quite familiar. In fact, it is not unlike the demand curve depicted by DOE in its conceptual discussions of the natural gas market (see Figure A.4). However, the point at which demand becomes inelastic for the second time, the point at which the curve turns down for the second time, occurs at a higher price than in DOE's conceptual curve. The difference in shape is significant for two reasons which will be elaborated below. First, it makes the benefits of oligopoly pricing secure. That is, the benefits are impervious to (or "robust" with respect to) the assumptions made about the shape of the marginal cost curve. Second, it also has major implications for the behavior of the market, even if competition is assumed. The steepness of the demand curve at prices below $5.00 means that the market will not be very responsive to price changes.

2. The Supply Curve

The second curve necessary to calculate the market equilibrium and/or the point of maximum profit for oligopolists is the marginal cost (supply) curve (see Figure A.5). DOE gives 1980 marginal costs in 1980 $/mcf for four categories of domestically produced gas -- associated ("no

FIGURE A.3

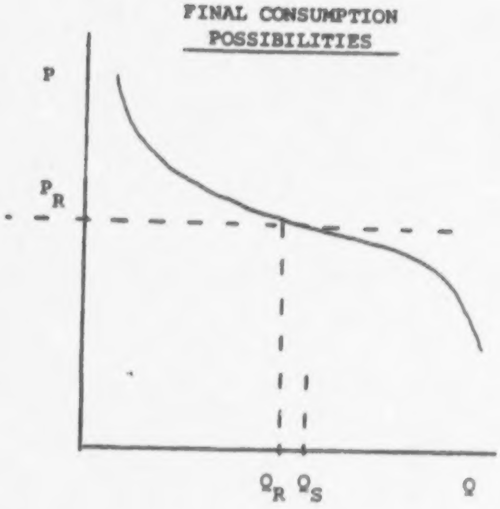
MAXIMUM POTENTIAL NATURAL GAS DEMAND CURVE



Source: Tables A.1 and A.2

FIGURE A.4

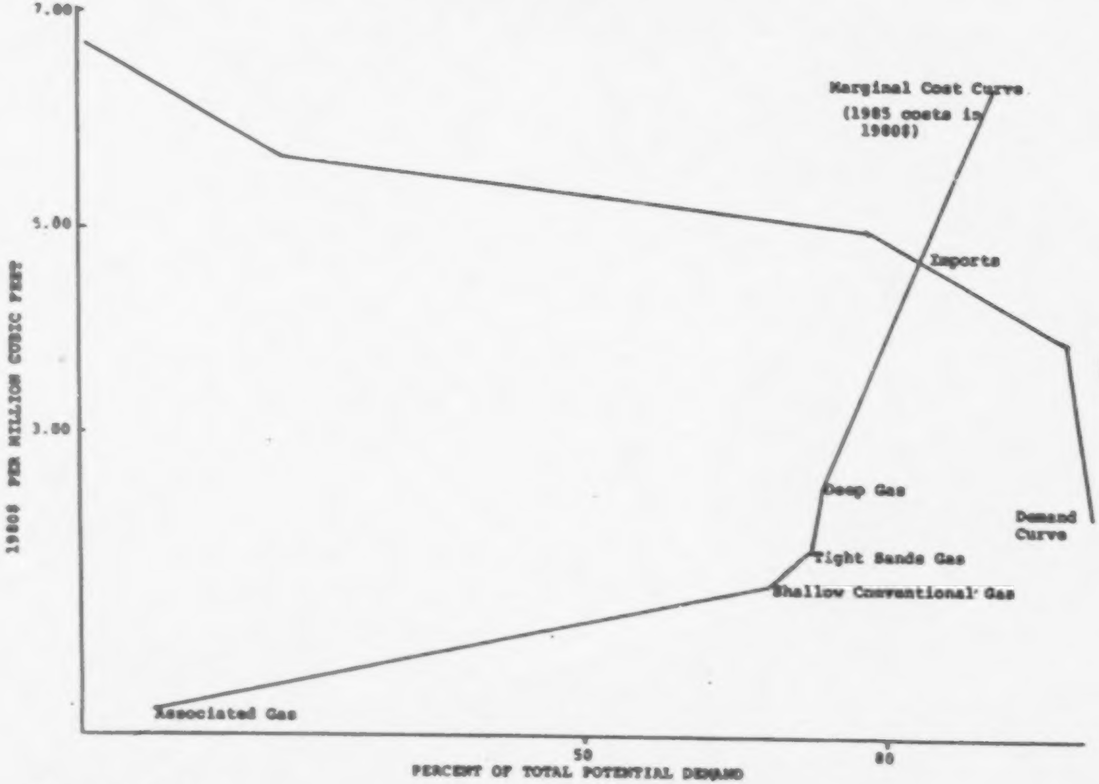
THE DEPARTMENT OF ENERGY'S CONCEPTUAL DEMAND CURVE


FINAL CONSUMPTION POSSIBILITIES
P
P_R
Q_R
Q_S
Q

Source: DOE, Two Market Analysis, p. A-97

FIGURE ...5

MARGINAL COST CURVE FOR NATURAL GAS



Source: See text

cost"), shallow conventional ($1.24), tight gas ($1.50) and deep gas ($2.15).

Since all prices used to plot the demand curve are 1985 prices stated in 1980 $/mcf, the costs are stated on the same basis for both demand and supply. However, the supply costs are estimated for 1980, not 1985. Therefore, it is necessary to calculate marginal costs for 1985.

Marginal costs will rise over time and DOE assumes they will rise as a function of the declining success rate of natural gas exploration. If success rates change differently for each category of gas exploration, then the shape of the marginal cost curve could change. However, for the base case, DOE assumed a real 2.5 percent increase in marginal costs per year. This leaves the shape of the curve largely unaffected. For the purposes of moving five years into the future, this would appear to be a reasonable assumption. The marginal cost curve shown in Figure A.5 includes this 2.5 percent per year real price increase for the five years between 1980 and 1985.

Here it should be noted that DOE's initial marginal costs for 1980 include an 8 percent real rate of return (normal profits). However, if we compare the initial marginal cost to the actual prices being allowed or paid in the market in 1980, we discover that the rate of return is much higher than 8 percent (see Table A.3). The initial marginal cost estimates imply actual costs (costs before profits are added) of $1.14/mcf for conventional shallow gas,

Table A.3

ESTIMATING IMPLICIT RATES OF RETURN FOR VARIOUS CATEGORIES OF NATURAL GAS

	(1) Initial Marginal (1980$ mcf)	(2) Profit (8% real)	(3) Cost [(3)=(1)-(2)]	(4) Ceiling[d] Price (1980$ mcf)	(5) Production[d] Taxes (7%)	(6) Additional[d] Costs	(7) Net Producer Revenues [(7)=(4)-(5)-(6)]	(8) Implicit Rule of [(8)=(7)-(3)/(3)]
Shallow Conventional[a]	1.24	.10	1.14	2.47	.16	.03	2.28	100
Tight Sands[b]	1.50	.11	1.39	4.92	.32	.03	4.57	229
Deep Gas[c]	2.15	.16	1.99	6.80	.48	.03	6.29	

Source: DOE, Two Market Analysis, as follows:

[a] Weighted average of regional marginal costs in Figure III-6, p. A-20.

[b] P. A-54.

[c] P. A-53.

[d] Attachment 2,p. 2-2.

$1.39/mcf for tight sands gas and $1.99/mcf for deep gas. The ceiling prices allowed for these types of gas imply revenues to producers (i.e., the market price of gas net of severance and other production taxes as well as cost add-ons) of $2.28/mcf for shallow gas, $4.57/mcf for tight sands gas and $6.29/mcf for deep gas (assuming deep gas can get the interstate marginal price that DOE assumes for 1981). The implicit rates of return (before income taxes) are 100 percent for shallow gas, 229 percent for tight gas and 216 percent for deep gas.

These extremely high rates of return are the result of the absence of pressure to drive prices below the effective ceilings which oil prices (and NGPA) allow. As discussed above, the fundamental market process which should drive prices down in a competitive economy -- the free entry of firms willing and able to produce gas at the average rate of return in the economy, thereby lowering the price and the rate of profit -- is obviously not working.

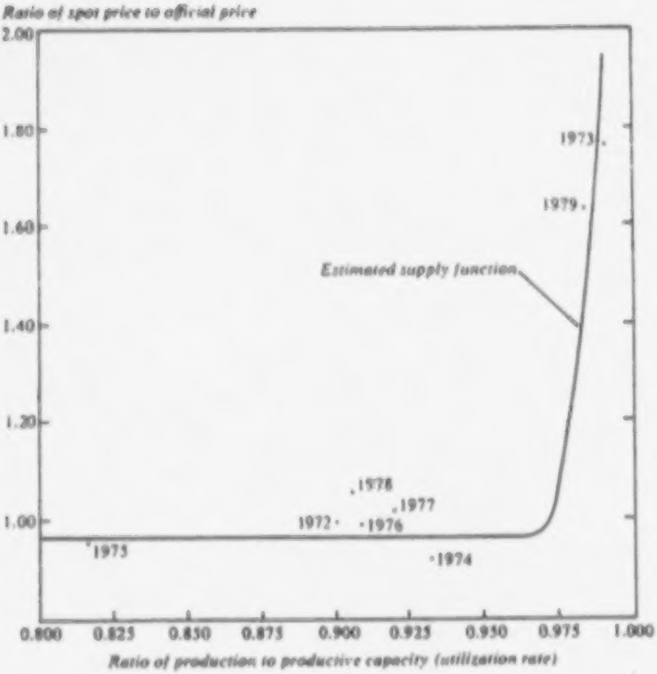
In fact, in DOE's model, domestic production never is able to meet domestic demand and, therefore, imports enter the market. However, those who export gas to the United States behave at least as silent partners in the oligopoly and do not try to steal more business by moving their prices down to undercut the abnormal profits of American producers. Indeed, they set their price at the theoretical marginal price -- the alternative fuel price. In DOE's analysis, this is $4.69/mcf (1980 $).

The marginal costs cited above generate a curve with a very shallow slope until conventional production is exhausted (on an annual basis) and a very steep slope thereafter. Interestingly, economist William Nordhaus has recently drawn a supply curve for the oil market with a similar shape (see Figure A.6). This curve is not unlike the curve DOE uses in its conceptual discussion (see Figure A.7). However, note that the slope of the actual curve derived from DOE's data is much more inelastic (steep) after the point of "inflection." Again, this difference in shape has two points of significance which will be elaborated below. First, it makes the potential benefits of oligopoly relatively secure. That is, the benefits are impervious to (or robust with respect to) the assumptions made about the shape of the demand curve. Second, it has important implications for market behavior even under the assumption of competition. It means that the market will not be very responsive to price changes.

DOE's model is "solved" at $4.69/mcf -- the equivalent of the lowest priced alternative (net of transmission and distribution costs). The market settles at a point at which about 16 percent of the maximum potential demand is not captured by gas producers. That is, 16 percent of the potential demand is allowed to slip away to alternative fuels.

FIGURE A.6

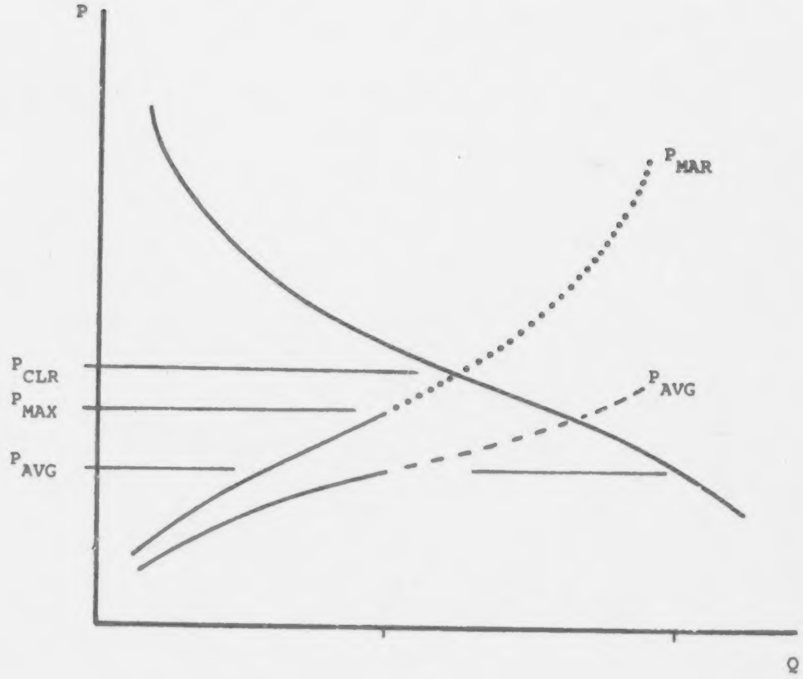
AN ESTIMATED SUPPLY FUNCTION FOR CRUDE OIL



Source: William Nordhaus, "Oil and Economic Performance in Industrial Countries," Brookings Papers on Economic Activity, 2, 1980, p. 369.

FIGURE A.7

THE DEPARTMENT OF ENERGY'S
CONCEPTUAL SUPPLY CURVE



Source: DOE, Two Market Analysis, p. A.99

3. The Market at Equilibrium

As noted above, the shapes of the supply and demand curves have important implications for the behavior of the natural gas market, even under assumptions of competition. Because the curves are so steep, i.e., inelastic, the market will not be very responsive to price changes. Neither demand nor supply will be changed much, even in the face of relatively large price increases. This insensitivity to price changes, even under the assumptions of competition, deserves further empirical analysis.

Even in DOE's analysis, in the long run, the supply elasticity is very small. Every decontrol scenario leads to a lower total supply than a continuation of NGPA. Furthermore, in the short run, DOE's analysis shows very small supply responses to price increases. Table A.4 shows the calculation of the aggregate market elasticity that DOE projects for accelerated phased decontrol, when compared to a continuation of NGPA. It can be seen that the price elasticity of supply is less than .07 in all years and the average is only .04. That is extremely small. DOE's data is intended to test comparisons between scenarios within years (e.g., NGPA compared to accelerated decontrol in 1983). However, the conclusion about supply elasticity stands up when the data is looked at in another way. For example, note that the supply elasticity between the year before decontrol and the year after decontrol under NGPA (compare 1984 to 1985) is only .039 percent.

Table A.4

IMPLICIT SUPPLY ELASTICITIES
IN THE AGGREGATE NATURAL GAS MARKET

	NGPA Base Case			Accelerated/Phased Decontrol (All New Scenario)			
	(1) Wellhead Price (1980$/mcf)	(2) Domestic Demand (BCF)	(3) Wellhead Price (1980$/mcf)	(4) Domestic Demand (BCF)	(5) % Price Difference (5)=[(3)-(1)]/(1)	(6) % Demand Difference (6)=[(2)-(4)]/(4)	(7) Implicit Elasticity (7)=(6)/(5)
1982	2.27	17737.6	3.05	18033.9	34.3	.5	.015
1983	2.42	17155.0	3.81	17605.0	57.4	2.6	.045
1984	2.61	16671.7	4.42	17440.5	69.4	4.6	.066
1985	4.45	17131.6	4.69	17088.7	-		

Source: DOE, Two Market Analysis, Attachment IV.

Calculation of the demand elasticity is more complex since there is a great deal of fuel switching that goes on in the gas market. Industrial users of oil switch to gas as do some residential consumers. Table A.5 presents a calculation of the implicit demand elasticities in the aggregate gas market that DOE projects for accelerated decontrol. In order to take account of fuel switching, the demand utilized as the basis for the calculations is the maximum potential gas demand, i.e., the total energy consumed by all potential gas users. Since the oil price is identical for all scenarios, any change in demand must be due to changes in the natural gas price and changes in the mix of oil and gas used by the aggregate of consumers. That is, if some oil consumers switch to gas, they may pay a price that is lower than they would have paid for oil. Their effective price is lower and their demand will be higher. The aggregate price paid by all consumers would also be lower. To compensate for this shift in the mix of fuels, we have calculated an "effective" average energy price for all potential gas consumers under NGPA and used it as the basis for calculating demand elasticities.

It will be noted that demand elasticities are somewhat higher than the supply elasticities, ranging from .088 to .184 and averaging about .14. The implicit elasticity for the year in which decontrol begins under NGPA is .18. These elasticities are consistent with other estimates.[3] They are also quite low compared to other commodities.

Table A.5

IMPLICIT DEMAND ELASTICITIES
IN THE AGGREGATE NATURAL GAS MARKET

	NGPA Base Case			Accelerated/Phased Decontrol (All New Scenario)		Estimating the Elasticity		
	(1) Wellhead Price (1980$/mcf)	(2) Effective Wellhead Price	(3) Domestic Demand (BCF)	(4) Wellhead Price (1980$/mcf)	(5) Domestic Demand (BCF)	(6) % Price Difference (6)=(4)-(2)/(2)x100]	(7) % Demand Difference [(7)=(3)-(5)/(2)x100]	(8) Implicit Elasticity (8=7/6)
1982	2.27	2.44	22908.7	3.05	22495.1	25.0	-2.2	-.088
1983	2.42	2.54	22659.1	3.81	20754.1	50.0	-9.2	-.184
1984	2.61	2.72	2268.6	4.42	20461.6	62.5	-9.3	-.149
1985	4.45	4.02	20438.0	4.69	—	-	-	-

Source: DOE, Two Market Analysis, Attachment IV.

Thus, the shapes of the supply and demand curves do not resemble the classical, moderately elastic straight lines typically used to depict "competitive" situations. Any theoretical conclusions drawn about typical competitive situations on the basis of those typical curves should not be extrapolated to the natural gas market. Above all, one must not assume a great deal of price sensitivity even where competition is assumed. The implications of these steeply sloping supply and demand curves (when compared to the classical curves of competitive supply and demand), which are explored in other reports in this series, are:

1. Total supply under decontrol is not greater than under a continuation of NGPA, even though prices are higher, because supply responses are small.
2. The equity loses that one might predict for decontrol are larger than expected because demand responses are small and consumers bear more of the burden than expected.
3. The efficiency gains that one might predict for decontrol are smaller than expected because supply and demand responses are smaller than expected.

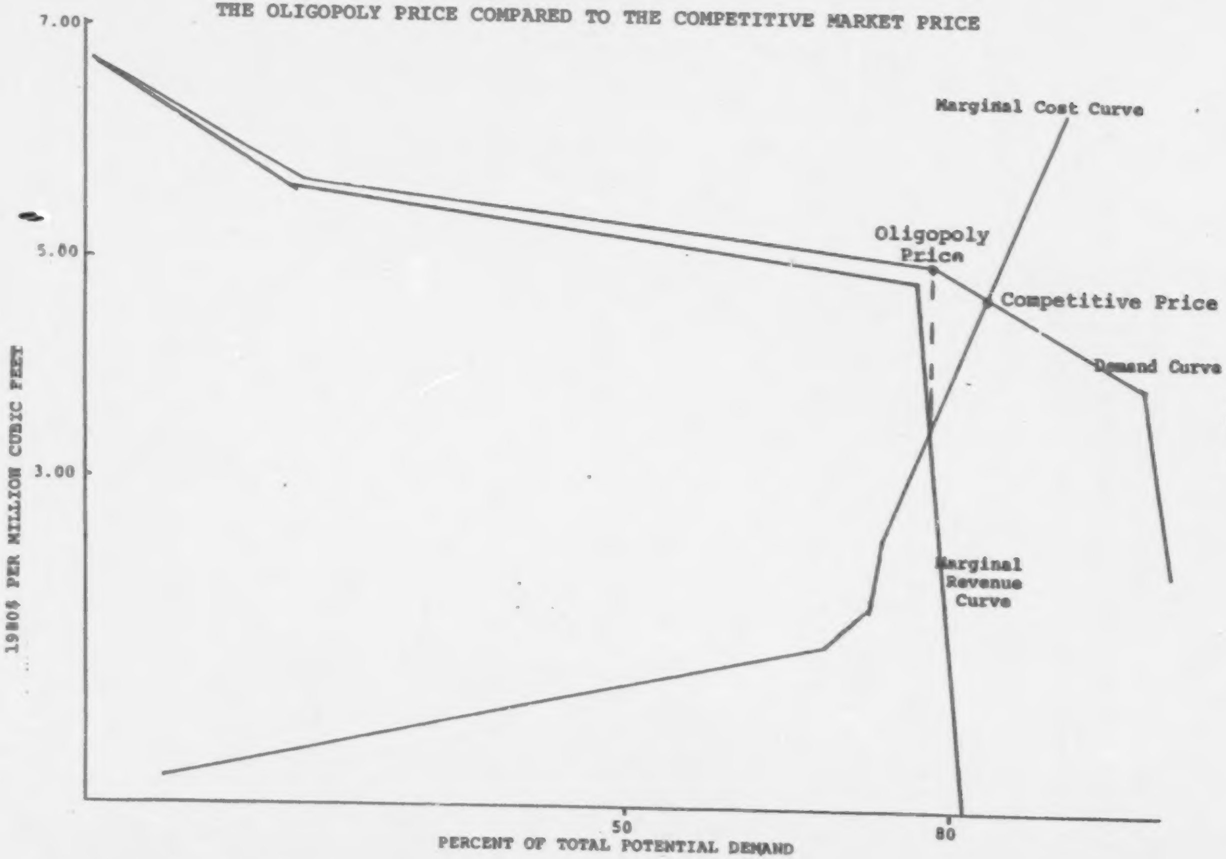
Having examined the implications of the shape of the supply and demand curves for the analysis when competitive behavior is assumed, we turn next to the analysis of situations in which non-competitive behaviors are assumed.

E. The Oligopoly Solution

If producers behave rationally, they will examine their marginal cost and marginal revenue curves in order to choose the price/quantity combination which will maximize profits. If they are oligopolists or monopolists, each

FIGURE A.8

THE OLIGOPOLY PRICE COMPARED TO THE COMPETITIVE MARKET PRICE



Source: Table A.1 and A.2.

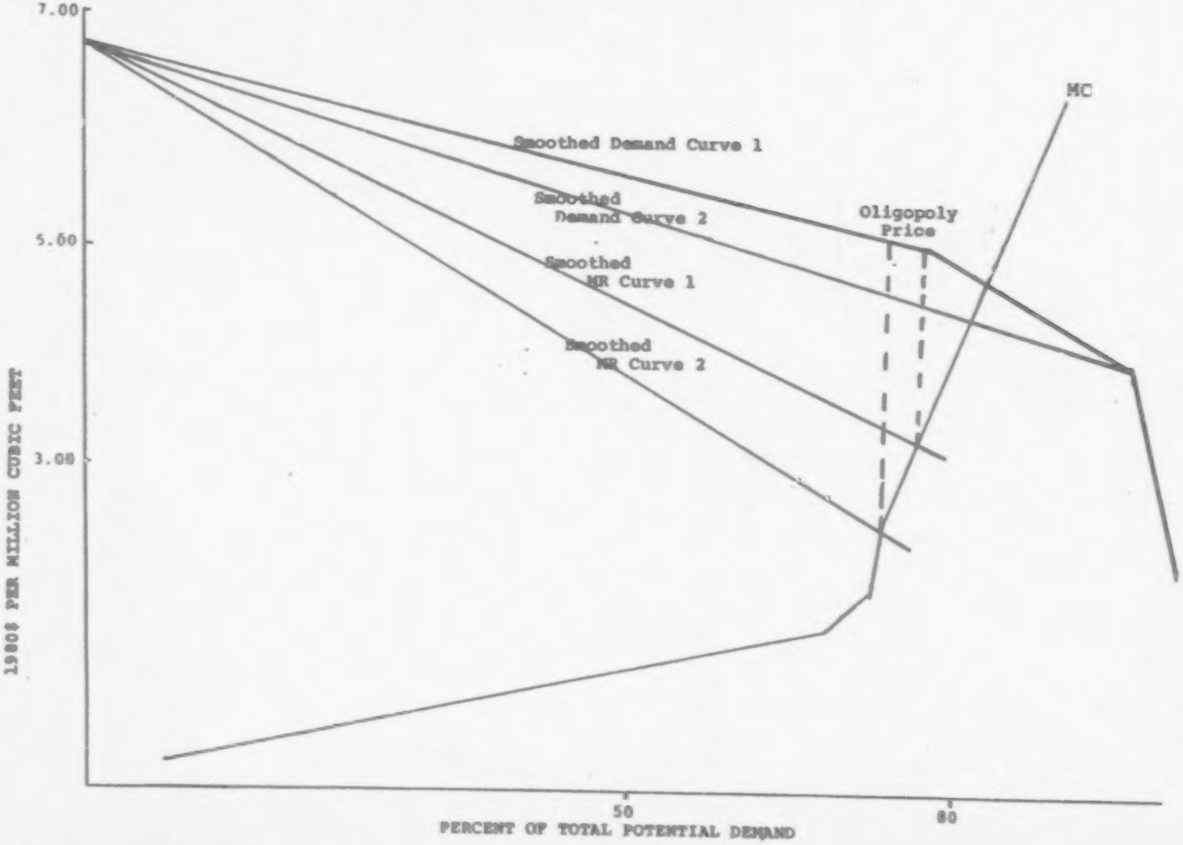
producer will not face a perfectly elastic demand curve. In fact, each oligopolist will face a demand curve that has a slope some place between the market demand curve and a perfectly flat demand curve. For purposes of this analysis, we will assume that each producer faces a demand curve with the slope of the market demand curve. This would fit a strict monopoly or a number of oligopoly arrangements.

In order to arrive at the monopoly (oligopoly) price, we must calculate the marginal revenue curve (see Figure A.8). Because the actual data is not smooth, the marginal revenue calculations are somewhat erratic, but an actual plot of the curve shows that the point where marginal costs equal marginal revenues is around the $5.00 point. Several smooth curves yield almost identical results (see Figure A.9).

Because both the marginal cost and marginal revenue curves are so steep, this point of market equilibrium under oligopoly behavior is quite robust. That is, if we were to assume that the shape of one of the curves was different, or we were to shift either curve up or down, the result would be largely unaffected. For example, Figure A.10 shows the analysis with the marginal cost curve calculated assuming marginal costs escalated at 15 percent (real) per year (but holding import prices constant). The oligopoly price would be altered little, ranging from $5.00 to $5.10, depending on which specification of the marginal revenue curve is used. If import prices escalate at 15 percent per year, the results still are about the same.

FIGURE A.9

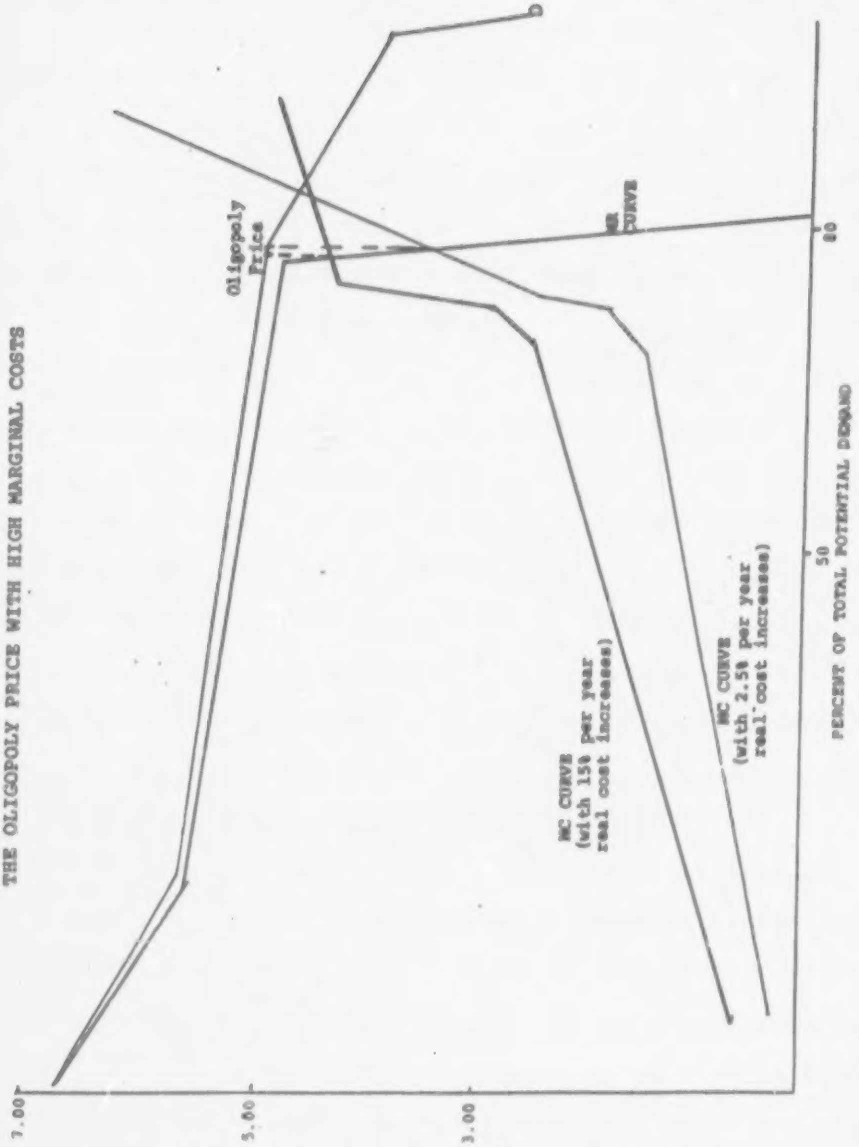
THE OLIGOPOLY PRICE WITH SMOOTHED DEMAND CURVES



Source: Tables A.1 and A.2

FIGURE A.10

THE OLIGOPOLY PRICE WITH HIGH MARGINAL COSTS



Source: See text

It should be noted that the oligopoly price would reduce supply by about 6 percentage points below the competitive market solution. Assuming a higher cost curve, the reduction in supply might be as large as 13 additional percentage points. Thus, an oligopoly assumption will lead to a market price about 10 percent higher than the competitive assumption with the quantity supplied reduced by at least 6 percentage points.

A message of equal significance to be drawn from the analysis is that the oligopoly price will be sensitive to the residential, not the industrial, market. That is, over one-quarter of all the demand occurs as interstate residential demand at $5.08 and this appears to be the critical point on the demand curve.[4] The high sulfur residual oil market is not important to the oligopolist and he foregoes most of it.

The residential demand is the most important point on the demand curve and it is a point about which there are significant differences of opinion in regard to the true elasticity of demand. In the next section, we examine an alternative assumption about residential and commercial demand. This leads us to redraw the demand curve and examine the implications of a differently shaped demand curve for the market price set by oligopolistic behavior.

F. Alternative Assumptions About Residential/Commercial Sector Demand

In calculating the alternative fuel prices for industrial and electric utility demand, DOE included fuel conversion costs (i.e., the cost of switching to gas) where such costs are assumed to exist. Moreover, at the margin, dual fuel burning capacity was assumed to exist so that there are no conversion costs. DOE did not factor conversion costs into the alternative fuel price for the residential and commercial markets since these markets were not near the theoretical margin.

However, if residential and commercial demand is going to play a critical role in setting the oligopoly price, then the rational oligopolist would definitely want to take conversion costs in those sectors into account. That is, if residential and commercial consumers must incur additional costs to convert from natural gas to some alternative, this raises the effective cost of the alternative fuel. Oligopolists can capture some of this in their price without fear of losing that demand. In fact, there is very little dual fuel burning capacity in the residential and commercial sectors and very significant conversion costs in those sectors.

Let us take a simple example. First, we assume conversion costs of $1400 to be amortized (simple payback) over seven years.[5] Spread over an average annual consumption of 100 million BTUs per year, this would add $2.00/mcf to the effective alternative fuel price.[6] The commercial sector would have larger volumes of gas consumed but higher conversion costs, so that $2.00/mcf is a reasonable estimate for this sector as well. Finally, we assume that all residential and commercial users must incur these costs.

The resulting demand curve (see Figure A.11) becomes much smoother than the earlier curve and less elastic, i.e., steeper. A straight line marginal revenue curve now cuts the marginal cost curve at a lower quantity leading to a higher price. The oligopolist would optimize profits in the $5.40/MCF range and supply would be reduced by an additional 10 percentage points.

This modification of the demand curve leads to rather robust results. If we assume only $1.00/mcf in conversion costs, the oligopoly price would be between $5.30 and $5.40.

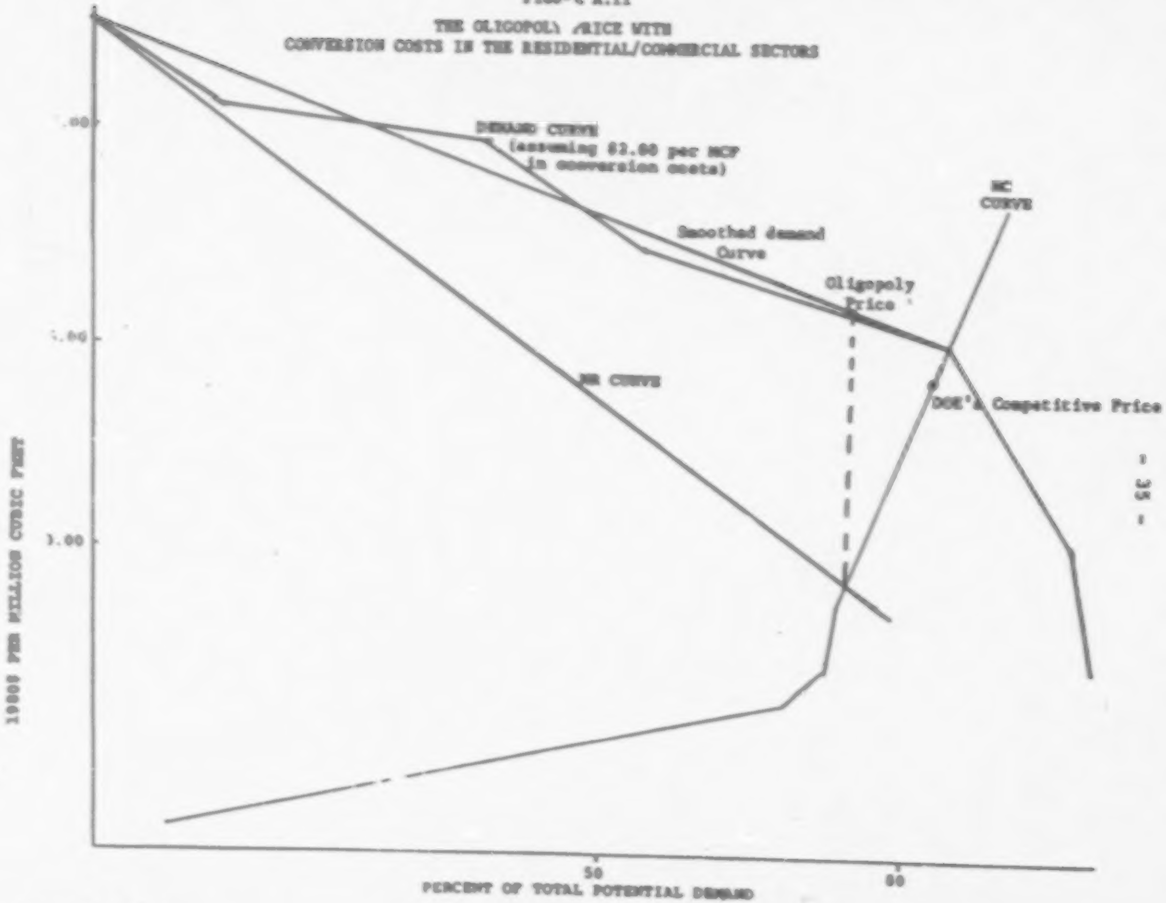
Obviously, different assumptions about conversion costs and/or more detailed analysis of the capacity to switch fuels in the short and long term might alter these outcomes. However, some conversion costs must be factored in and a price range of $5.30-$5.40 for the oligopoly wellhead price seems to be a good estimate. This is a price that is about 15 percent higher than DOE's assumed market clearing price and about twice as high as the industry estimates. The quantity supplied would be about 15 percent below the competitive market solution which means that 30 percent of the total demand is foregone.

G. Summary and Conclusion

In this Appendix, the possible impact of oligopolistic, as opposed to competitive, behavior on the market price of natural gas has been examined.

FIGURE A.11

THE OLIGOPOLY PRICE WITH
CONVERSION COSTS IN THE RESIDENTIAL/COMMERCIAL SECTORS



Source: See text

It has been shown that the configuration of the supply and demand curves is such that oligopolists could administer prices with considerable security. In contrast to the market clearing price estimated by DOE of $4.69/mcf, an oligopoly situation could result in a market price in excess of $5.40, although a range of $5.30 to $5.40 may be more likely.

The estimation of the supply curve also reveals that the rate of return on natural gas production is extremely high -- between 100 and 300 percent. These rates of profit can be presumed to reflect an absence of competitive conditions on the supply side of the market.

From a more general perspective, the shape of the demand and supply curves that have been calculated should caution against simplistic analyses of the gas market even where competition is assumed. Both curves are quite steep (i.e., inelastic) at the point of equilibrium, meaning that they are insensitive to price changes.

FOOTNOTES

[1] DOE, Two Market Analysis of Natural Gas Decontrol (Washington, DC: Government Printing Office, November 1981).

[2] A brief description of the basic structural characteristics of the natural gas market that lead us to this conclusion can be found in Dr. Mark Cooper, Director of Research, Consumer Energy Council of America, "The Implementation of Title I of the Natural Gas Policy Act of 1978," testimony before the Committee on Energy and Natural Resources, United States Senate (November 5, 1981).

[3] Robert S. Pindyck, The Structure of World Energy Demand (Cambridge, MIT Press, 1979).

[4] The slope of the demand curve can be described as follows:

There is a section of the curve (about 20 percent of the total demand) that is relatively inelastic (steep) at high wellhead prices (between $5.70 and $6.70/MCF in 1980 $). This demand occurs in the intrastate market. This block combines high priced alternative fuels with low transmission costs. That is, the wellhead gas price could be quite high because the alternative is expensive and transmission and distribution costs are low.

There is then a second section of the curve (about 60 percent of total demand) that appears quite elastic (between $5.00 and $5.60/MCF in 1980 $). Most of this block (43 percentage points of the 60 percentage points) is made up of the interstate residential, commercial and industrial nonboiler demand. This block combines high priced alternatives with high transmission costs.

Next, there is a block (about 18 percent of total demand) which is relatively inelastic at prices between $3.90 and $5.00/MCF in 1980 $. This is primarily industrial demand -- plus some commercial demand. This includes the category of high sulfur residual.

Finally, there is a small block of demand (about 3 percent) that is very inelastic at low prices. This block is intrastate boiler demand.

In DOE's analysis, the industrial demand between $39.0 and $5.00 is the critical marginal demand. In the oligopoly situation, the residential demand above $5.00 appears to be the critical marginal demand.

[5] See, Consumer Energy Council of America, "An Analysis of the Economics of Fuel Switching Versus Conservation for the Residential Heating Oil Consumer" (Washington, DC, October 5, 1980) for a discussion of conservation costs.

THE PAST AS PROLOGUE II

THE ECONOMIC EFFECTS OF RISING ENERGY PRICES: A Comparison of the Oil Price Shock and Natural Gas Decontrol

A. Introduction

One of the central questions that must be answered in every policy decision affecting energy prices is "What will the economic impact be?" Energy is of such central importance to the conduct of most economic activities that pricing decisions can have a major impact on the level and type of output that our economy produces.

In this report the Consumer Energy Council of America Research Foundation (CECA/RF) analyzes, from a number of perspectives, the relationship between changes in the price of energy and changes in economic activity. First, we make a brief statement of the general theoretical relationship between changes in energy prices and economic activity. Second, we review the record of the impact of the "oil price shock" on the economy. Third, we examine recent projections of the impact of natural gas decontrol.

The central conclusion that the report reaches is that energy price increases have a massive, negative impact on the economy, an impact that persists for a considerable length of time -- at least a decade. Further, policies to mitigate that impact -- at the level of individuals and at the level of the general economy -- have either not been effective in the past or have simply never been developed and implemented. The prospects for natural gas decontrol appear to be equally bleak.

B. Energy and the Economy: A General Conceptualization

The negative economic impact of rising energy prices occurs in two interconnected ways. There tends to be a reduction in the level of output and also a loss in productivity.

1. Economic Activity

The reduction in output that rising energy prices may cause stems from the fact that, in the short run, it is difficult to find substitutes for energy in many economic activities (i.e., it is price inelastic).[1] When prices rise, a larger share of income must be devoted to energy because consumption cannot be reduced in the short run. The increase in income devoted to energy prices may appear in two ways. First, the income spent directly for energy, e.g., household heating fuels, etc., will rise. Second, the energy costs related to producing all goods and services will rise. If the producers of these goods and services are able to pass through the increase in energy costs to consumers, then there will be a general increase in the price level of those goods. If they are not able to pass the increase through, there will be a reduction in profits in non-energy sectors.

Given the general tendency of prices in our economy not to decline, the response to a rise in energy prices tends to be an increase in the general price level. That is, rising energy costs will be passed through. If the money supply does not expand to accommodate the price increase and wages do not rise as fast as prices increase, then the price increase reduces real income (i.e., the same number of dollars purchases fewer goods and services).[2] Reduced real income means lower consumption outlays and lower real GNP.

This effect can be compounded by an increase in interest rates.[3] Rising prices lead to an increased demand for credit to finance higher levels of spending or investment. Again, if monetary policy is not accommodative, as interest rates rise (due to increased demand and tight money supply) the costs of financing consumption or investment increase and the level of real spending declines.

In reality, the response of the economy to price increases tends to be a mixture of these possibilities. Most of the price increases are passed through (with a lag) and wages try to keep up (with a longer lag). The general consensus is, however, that in the short run, there is an unavoidable (1) increase in prices, (2) reduction in real income, (3) reduction in real output and, as a consequence, (4) an increase in unemployment. There is also an emerging consensus that accommodative, rather than tight, monetary and fiscal policy can reduce these impacts, but not eliminate them.

While there is a general consensus that short run negative impacts occur when energy prices are increased, there is no consensus about just how long the short run is or how large the impacts will be.[4] Some argue that the adjustment period can be quite long -- well over a decade; others envision shorter periods of adjustment, up to a decade.

2. Productivity

Rising energy prices can also have a negative impact on productivity for a number of reasons.[5]

1. Because the utilization of labor and capital declines more slowly than the decline of output, productivity declines (i.e., labor is "hoarded" and capital is not scrapped at a sufficiently rapid pace to keep productivity up).

2. As economic activity declines, the general rate of investment drops off, slowing productivity growth.

3. As energy prices rise, capital and labor are substituted for energy in the production process and that means less output per unit of capital and labor input.

4. Insofar as capital and labor are not perfect substitutes for energy, an additional loss in productivity occurs.

5. The need to invest in energy savings delays the investment in equipment designed to enhance labor productivity. This reduces the growth in the productivity of labor.

The first and second effects are principally short term effects; the third, fourth and fifth effects may be somewhat longer term in nature. Once again, there tends to be general agreement that these effects occur; but there is rather wide disagreement about how large they are and how long they last.[6]

3. Potential Benefits

It should be noted here that there are potential efficiency benefits of decontrol. Three such benefits can be noted.[7]

1. It is possible that more aggregate output can be achieved for each unit of domestic resources expended in acquiring a given level of energy supply. That is, if resources are diverted from the search for hard-to-find energy sources to more easily located and/or produced sources, then less real resources will be used to produce the same amount of available energy.

For example, if incentives have been structured by partial decontrol to direct exploration toward more expensive deep gas, then full decontrol might cause producers to shift their exploration toward less expensive shallow gas.

Producers could consume fewer resources in finding the same amount of gas.

These saved resources can then be put to alternative uses in society. If the reduction in real resource costs is reflected in lower energy prices, consumers will have the additional real resources at their disposal. If energy prices do not fall, then energy producers will have the additional real resources at their disposal.

2. If domestic supplies replace imports and reduce the aggregate import bill, then domestic economic activity will be stimulated to the extent that resources kept in the domestic economy recycle through the economy more efficiently than exported dollars.

3. Controlled energy prices may result in too much energy being consumed by certain consumers and, if some form of energy rationing results, too little being consumed by others. This inefficient allocation may reduce the magnitude of total output.

The first set of benefits tends to be long term in nature. The second and third are both short and long term. Again, considerable difference of opinion exists over the magnitude of these potentially positive impacts because they are critically dependent on whether resources are actually made available, on whom has access to them and on the uses to which they are put.

4. Conclusion

Economic theory does not lead to clear conclusions about the ultimate impact of the decontrol of energy prices. That is, there is a sound theoretical basis to expect significant economic and productivity losses and a sound theoretical basis to expect some resource gains, but there is no theoretical basis for deciding which will be larger. The bottom line is an empirical issue, not a theoretical one. That is, the ultimate impact is determined by the shape (elasticity) of the demand and supply curves for energy (which determines the benefits) and the elasticity of substitution between energy and other factors of production (which determines the costs). Appendix A presents a brief conceptualization of this issue. However, it should be most emphatically noted that, as the following discussion shows, the empirical evidence strongly suggests that the potential efficiency benefits do not outweigh the costs. The empirical answer seems to be negative.

The disagreement over the magnitude and duration of the impact of decontrol is most frequently expressed in the results of the econometric models which are used to simulate the behavior of the economy. The next section reviews the impact of the oil price shock on the economy as seen through the eyes of a number of econometric models. All of the models tend to confirm the general conceptualization presented above, although they differ in details.

C. The Oil Price Shock

1. Prices and Inflation

The first, critical macroeconomic issue relating to decisions affecting energy prices is the magnitude and speed of the price increase. The greater and more rapid the price increase, the greater the impact will be throughout the economy. For two major reasons, price increases should be studied first and separately from other macroeconomic impacts such as the impact on unemployment, changes in output, etc.

First, as noted above, the price increases are the trigger to the transfer of resources on the demand side and the escalation of costs on the supply side.

Second, to a considerable extent, price and inflationary impacts can be studied in a simple fashion without complicating assumptions, projections or econometric models. Other economic impacts cannot be studied in such a format.

The magnitude of price increases in crude oil and petroleum products resulting from decontrol is described in Table 1. Price increases in crude oil at the wellhead, refiner acquisition costs, and product prices were all well in excess of 64 percent between June 1979 and November 1981.

These price increases in petroleum products far exceeded the increases in the Consumer Price Index (CPI). All items in the CPI increased by 31 percent in that two year period. Of course, energy prices are one important component of the CPI itself, so that non-energy items in the

Table 1

RISING PRICES SINCE DECONTROL

	May 1979	November 1981	Percentage Increase
Refiner Acquisition Costs[a]			
Domestic Crude ($/bbl)	12.41	33.49	169.9
Importedd Crude ($/bbl)	19.00	36.21	90.5
Consumer Prices[b]			
Heating Oil ($/gallon)	.656	1.209	84.2
Gasoline ($/gallon)	.823	1.351	64.2
Energy (index, 1967=100)	260.8	417.6	60.2
Consumer Price Index[c]			
All Items (index, 1967=100)	214.1	280.7	21
All Non-energy Items (index, 1967=100)	210.7	270.4	28

Source: U.S. Department of Energy

[a] Monthly Energy Review, various issues

[b] U.S. Bureau of Labor Statistics, Consumer Price Index

[c] Consumer Price Index, various issues

Index increased more slowly than the overall index. An index composed of all non-energy items would have increased only 28 percent in that period.

Moreover, rising petroleum prices have an indirect impact on all non-energy items in the index. That is, rising energy prices increase the cost of other items, as noted above. It is possible to estimate what the CPI would have been if energy prices had not been rising so rapidly. Such estimates vary depending on the econometric models used and the assumptions made about what prices would have been in the absence of decontrol. However, a review of a number of econometric analyses shows that the impact of rising oil prices on the GNP deflator was estimated to be in the range of a 2.7 to 3.0 percent cumulative increase between 1979 and 1981 (see Table 2). The impact on the CPI was somewhat higher, in the range of 3.9 to 4.9 percent.

Because these models were run in late 1979 and early 1980 they are partly retrospective and partly prospective with regard to the energy price shock of 1979-80. Thus, it is important to note that most of the estimates contained in Table 2 were based on estimated oil prices that were understated by about 30 percent because the analyses were performed before the spate of increasing prices had run its course. Therefore, the estimated impact of oil price increases on the GNP deflator should probably be in the 3.0 to 4.3 percentage point range, while increases in the CPI should probably be in the 5.6 to 7.0 percentage point range.

Table 2

ANNUAL CHANGES IN INFLATION DUE TO OIL PRICE INCREASES
(in percent)

Source	1979	1980	1981	1982	1983	1984
Congressioinal Budget Office						
May 1979: Decontrol only, GNP deflator[a]	+ .1	0	+ .3	0	0	0
June 1979: Decontrol only, GNP deflator[b]			+ .1	+ .4	+ .5	na
June 1980: Decontrol only, GNP deflator[c]	+ .2	+1.1	+1.7	+ .6	na	na
June 1980: Decontrol only, CPI-W[c]	+ .3	+1.5	+2.1	+ .7	na	na
Wharton (June 1980)[d]						
Second half of decontrol only: CPI (gasoline tax assumed)	na	- .92	+1.01	+2.01	na	na
Mork and Hall[e] (Nov. 1979)						
Total energy shock:	+1.8	+1.3	+ .1	na	na	na
Eckstein (DRI)[f] (Nov. 1979)						
Total energy shock: GNP	+ .9	+1.5	+ .4	- .2	0	+ .4
Total energy shock: Personal consumption deflator (CPI)	+1.1	+2.3	+1.5	+ .9	+ .6	+ .8
Thurman and Berner (MPS)[g] (Nov. 1979)						
Total energy shock: GNP deflator	+ .1	+1.1	+1.5	+ .5	- .3	na
Total energy shock: Personal consumption deflator (CPI)	+ .7	+1.6	+1.4	+ .5	- .2	na

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[a] Congressional Budget Office, *The Decontrol of Domestic Oil Prices: An Overview* (Washington, DC, May 1979), p. 45.

[b] Congressional Budget Office, Memorandum from Roy Scheppach to Jim Cubie (Washington, DC, July 12, 1979).

[c] Hearing before the Subcommittee on Energy of the Joint Economic Committee, Congress of the United States, *Impact of Energy Prices and Inflation on American Families*, July 8, 1980 (Washington, DC 1981), p. 72.

[d] Ibid., p. 65.

[e] Kurt Anton Mork and Robert E. Hall, "Macroeconomic Analysis of Energy Price Shocks and Offsetting Policies in Kurt Anton Mork, ed., *Energy Prices, Inflation, and Economic Activity* (Cambridge, Ballenger, 1981).

[f] Otto Eckstein, "Shock Inflation, Core Inflation and Energy Disturbances in the DRI Model," in Mork, *Energy Prices*.

[g] Stephan Thurman and Richard Berner, "Analysis of Oil Prrice Shocks in the MPS Model," in Mork, *Energy Prices*.

This range of estimates is consistent with a rule of thumb that is frequently used to estimate the impact of rising energy prices on consumer prices.[8] For every one percentage point that energy prices raise the CPI directly, it is assumed that indirect impacts will add an additional .5 to 1 percentage points. In Table 1, it was shown that the direct contribution of energy prices to the CPI was about 3 percentage points. The rule of thumb would have indicated a total impact of 5 to 6.6 percentage points.

A recent estimate by the U.S. Department of Energy using a modified version of two of the models included in Table 2 (Wharton and DRI) and data which reflects the full impact of rising prices confirms these estimates.[9] According to DOE, price increases in all energy sources are found to have contributed between 4.1 and 5.5 percentage points to the GNP deflator and between 5.7 and 7.3 percentage points to the CPI in 1979 and 1980 combined.

Thus, it seems safe to say that oil price increases accounted for between 20 and 25 percent of the total inflation felt in the 1979-1981 period. Such an impact undoubtedly had major implications for the economy. It also certainly had an impact on the restrictive monetary and fiscal policies that were pursued during this period in an effort to lower the rate of inflation.

2. The Impact on Economic Activity

With price increases great enough to affect the GNP deflator and CPI so dramatically, one must expect to observe rather large decreases in economic activity. Estimating these impacts relies almost entirely on econometric modeling. As noted above, such modeling is subject to a high degree of uncertainty. The differences that exist between econometric models result from differences in the way they try to simulate the economy. The uncertainty of the modeling stems from differences in the structure of the econometric models (assumptions and parameters) and differences in estimates of input variables (energy prices). Major differences center on the assumptions about and the detail with which the models handle the response to rising energy prices of labor (in its wage demands) and industry (in changing the amount of energy, labor and capital used in production).

In spite of the differences between the models, a number of them produced fairly consistent estimates of the impact of rising energy prices (see Table 3). We are inclined to stress their similarities, rather than their differences. Aside from the CBO analysis, which was based on very low price estimates because it was done very early, and Wharton, which took only the later stages of price increases into account, the other analyses show that the loss of GNP is in the range of 2.5 to 4.3 percentage points in the 1979-1981 period. The increase in unemployment falls

Table 3

CHANGES IN ECONOMIC ACTIVITY AS A RESULT OF RISING OIL PRICES

	1979	1980	1981	1982	1983	1984
GNP Changes						
CBO, May 1979: Decontrol only	.0 to -.1			.0 to -.2		
CBO, June 1979: Decontrol only	.0 to -.2			-.2 to -.4		
Total Energy Price Shock						
Wharton	na	- .3	- .3	- .6	na	na
Mork and Hall	-1.1	-2.8	+ .4	na	na	na
Eckstein	-.1	-2.2	-2.0	+ .5	+ .6	+ .9
Thurman and Berner	- .5	- .9	-1.4	-1.2	-1.0	na
Employment Changes						
CBO, May 1979	0			0 to + .2		
CBO, June 1979	+ .1			+ .1 to + .3		
Wharton	-	.14	.36	.76	na	na
Mork and Hall	+ .4	+1.2	+ .9	na	na	na
Eckstein	0	+ .4	+1.3	+1.2	+ .7	+ .7
Thurman and Berner	+ .1	+1.3	+1.4	+ .5	+ .1	- .1

Sources: See Table 2.

in the 1.5 to 2.8 percentage point range. Once again, these estimates are based on energy price projections that were about 30 percent too low because they were done before the rise in energy prices had run its course. Therefore, the negative economic impact was in fact greater than the models predict. Considering actual energy prices, it would be reasonable to assume that the loss in GNP was on the order of 3.5 to 6.1 percent and the increase in unemployment was between 2.1 and 4 percentage points.

Again, the recent econometric analyses conducted by DOE tend to confirm these results.[10] Incorporating the full magnitude of price increases, DOE estimates that a loss in GNP in 1978-80 of between 5.1 and 5.9 percent and an increase in unemployment of between 1.4 and 3.8 percentage points can be attributed to rising energy prices.

The behavior of specific elements of the economy also conforms to the predictions of macroeconomic theory (as described above). In 1979 and 1980, investment suffered a major setback as a result of the oil price shock -- a reduction of as much as 12 percent.[11] Productivity was reduced as well, by as much as 3 percent.[12] Some estimates show that as much as one-third to one-half of the slow-down in productivity growth may have been due to energy price increases.[13] Expenditures on consumer durables were also particularly hard hit.[14] Investment in residential housing structures may have been reduced by as much as 15-20 percent while sales of American automobilies may have been reduced by as much as 40 percent.[15]

3. Assessing the Impact

Judging the actual significance of the negative economic impacts can be a matter of perspective. It has become common among those inclined to downplay the importance of energy to focus on the entire period after the OPEC oil embargo (1973) in order to place the 1979-80 oil price shock in the context of a generally bad economic period.[16] Table 4 shows that the economy took a decided turn for the worse in 1973-80, compared to the previous eight years. The rate of growth of real GNP, real disposable income, investment and productivity slowed dramatically, while inflation and unemployment increased. Part of the downturn -- at least one-third and probably one-half -- can definitely be attributed to the energy price shock.

Some analysts focus on that part of the downturn which energy prices did not cause and look for a bigger "picture," thereby downplaying the importance of energy price increases. CECA/RF is inclined to take the opposite view.

We are struck by the fact that so much of the downturn can be attributed to this one factor. Energy is obviously a very major influence on economic activity. One will look in vain to find any other single factor that is as important. Moreover, there are even ways in which these

Table 4

THE IMPORTANCE OF RISING ENERGY PRICRES IN DETERMINING ECONOMIC PERFORMANCE

	Actual			Hypothetical Assuming no Energy Price Increase	Change Attributable to Energy Prices	% of Change Attributable to Energy Prices
	1965-1972 (1)	1973-1980 (2)	Change (3=1-2)	(4)	(5=2-4)	(6=5/3)
Real Growth of GNP (% per year)	3.5	2.4	-1.1	2.8	- .4	36
Real Disposable Imcome (% per year)	4.0	2.4	-1.6	3.3	- .9	56
Growth of Real Fixed Investment	4.0	.4	-3.6	2.0	-1.6	44
Rate of Change in CPI (Percentage points)	+4.1	+9.2	+5.1[a]	+6.9	+2.3[b]	45
Rate of Growth of Productivity (% change/year of output per person hour)	2.0	.2	-1.8	1.6	.4	22
Unemployment Rate (Average annual)	4.5	6.6	+2.1[a]	5.4	+1.2[b]	57

a/ Column 2 minus column 1.
b/ Column 4 minus column 2.

Source: DOE, The Interralationship of Energy and the Economy, 1981, Chapter 2.

analyses underestimate the impact that rising energy prices can have.

First, when the econometric analyses are conducted, only energy prices are changed in order to simulate what would have happened in the economy without a change in prices. This overlooks the fact that, as energy prices rose, many policy decisions were made in response to those rising prices. Is it really possible to separate energy price increases from the policy decisions which they directly caused and to which they were inseparably connected?

The most important policies in this regard are fiscal and monetary policies. As rising energy prices increased the rate of inflation, policy-makers responded by tightening the money supply and reducing fiscal deficits in an effort to slow inflation down.[17] Of course, these policies have recessionary impacts of their own, impacts which reinforce the impact of rising energy prices. Most analyses show that the restrictive monetary and fiscal responses to rising energy prices doubled the recessionary impact.[18] In this sense, energy prices caused about one-third of the economic problem directly and another one-third of the problem indirectly through the impact of energy price increases on monetary and fiscal policy. Thus, if one assumes a different path of energy prices, one should probably assume different fiscal and monetary policies as well.[19]

A second way in which the econometric analyses underestimate the impact of rising energy prices is not easily quantifiable, but it is nonetheless real. Rising energy prices had a major impact on the mood of the public and on policy-makers. The econometric analyses show that in the absence of rising energy prices, there would have been almost no recession in 1974-75 and no recession in 1980.[20] There would have been no "double digit inflation" at any time in the decade.[21] In this regard, energy pushed the economy past several major psychological thresholds (i.e., into a recession and over the double digit mark in inflation).

In 1980 alone, had energy prices not increased so rapidly, as many as three million fewer people would have been unemployed.[22] As many as two million more American automobiles would have been sold and an additional 250,000 housing starts would have been undertaken.[23] Here, too, critical psychological thresholds would have been avoided, especially rates of unemployment that rivaled those of the great depression in two of America's largest industries.

In short, the entire economic environment would have been different. The public mood would have been much less pessimistic, and certainly could have led to different consumption and saving patterns. Policy-makers would not have been thrashing about in search of economic quick fixes. The economy would have remained much closer to its historical path of relatively rapid and relatively stable expansion.

In this sense, energy may have been more than two-thirds of the problem -- one-third due to the direct impact of rising prices, one-third due to the indirect impact through monetary and fiscal policy, and an additional, unmeasurable amount due to the qualitative impact of having the economy appear to be in a state of utter chaos and on the brink of collapse. In the context of energy-price-policy-decisionmaking, it is important to recognize that in the 1970s and especially the 1979-80 period, the economy was not collapsing -- rather, to a very considerable degree, it was being crushed by energy prices. Had this been recognized, very different economic and energy policy decisions might have been made.

Two other general observations on these economic impacts are in order before we turn to the discussion of natural gas decontrol.

First, the general principle that lost purchasing power resulting from rising energy prices cannot be recouped in the short or mid-terms can be demonstrated on the basis of these estimates. In an earlier work, CECA/RF estimated that due to rising oil prices about $160 billion in real purchasing power was lost in the 1979-1981 period (in 1978 dollars).[24] If we use an estimate of 5 percent of GNP lost due to the oil price shock, then we conclude that about $130 billion was lost in real GNP (1978 dollars) through the end of 1981. Thus, about 80 percent of the loss in purchasing power is translated into a loss in GNP in the short run.

Second, it is important to note that the economic impacts persist over a long term. The headlines devoted to rising energy prices may pass quickly once the shock is over, but the negative economic impacts of those prices will keep working their way through the economy. Most of the models project a cumulating negative impact that lasts 5 to 10 years. There then ensues a period in which part of the economic losses may be recovered. In the long run, there remains an appreciable loss in total GNP.

D. Natural Gas Decontrol

1. Introduction

Having reviewed the theoretical explanations of why rising energy prices should be expected to have a negative impact on the economy and the empirical evidence which shows that oil price increases did affect the economy as predicted, we turn to the projections of the impact of rising natural gas prices on the economy. There are a number of reasons that we should expect rising natural gas prices to have significant negative economic impacts.

2. The Expected Impact of Natural Gas Decontrol

a. Prices

In a separate report, "Past as Prologue I: The Underestimation of Price Increases in the Decontrol Debate," CECA/RF has analyzed in detail the question of the price increases likely to follow from accelerated/phased decontrol of natural gas.[25] We have demonstrated that the price increases that will occur under accelerated decontrol of natural gas are quite similar to the price path that oil took during the oil price shock of 1979-80. This is one reason we would expect the economic impact following natural gas decontrol to be similar to the economic impact of the oil price shock. Below, we will show that the relationship between natural gas price increases and changes in the GNP deflator is very similar to the relationship between oil price increases and changes in the GNP deflator.

b. Fuel Uses

Second, the general arguments made above about the mechanisms by which energy price increases are translated into economic slowdowns certainly hold for natural gas. That is, the conceptual relationship between energy and the economy holds for gas. In fact, there are reasons to expect that the natural gas price increases might have even larger negative effects than oil price increases. These relate to the price elasticity of energy -- the key link between energy price increases and macroeconomic activity. That is, the ability to substitute for energy in the short and long term as a response to price increases dictates the impact of those price increases on the economy.

Although the aggregate price elasticity of natural gas appears to be similar to that of crude oil, the price elasticity in industrial uses is much lower.[26] Most studies suggest that the price elasticity of natural gas in industrial uses is only about one-half as large as the price elasticity of petroleum in industrial uses. Thus, natural gas price increases pose a greater problem of structural adjustment in the economy. This is especially true of the longer term productivity and economic impacts discussed above.

The analogy between the impact of oil and gas prices on the economy should not be taken too literally. There are obvious differences between the two fuels. First, we consume much more petroleum. Second, a much larger percentage of the petroleum we consume is imported from abroad. If one wishes to extrapolate from the analysis of the oil price shock to the impact of natural gas decontrol, great care must be taken.

Appendix B presents a number of steps that must be taken in order to make the comparison. It shows that the econometric analyses of the oil price shock, when used to predict the impact of natural gas decontrol, lead to reasonable estimates if they are treated properly.

c. Production

It should be noted, from the point of view of the domestic supply of energy, that oil and gas are produced in roughly the same geographic areas with roughly the same technology. The largest domestic producers of oil are also by far the largest domestic producers of gas.[27] Clearly, there is good cause to draw parallels between the two fuels.

3. Considerations in Deriving a Best Estimate of the Impact of Natural Gas Decontrol

Having seen that both theory and recent energy price history suggest significant economic impacts of natural gas decontrol, we review in this section a number of econometric estimates of the impact of natural gas decontrol on inflation, output and unemployment. The objective is to arrive at a best or a most reasonable estimate of those impacts. In order to do so, it is necessary to follow a very carefully conceived approach to the analysis. The following steps have been taken.

a. The Time Frame

Because the various decontrol scenarios do not agree on the quantity and price of gas that will be decontrolled, or the time period over which decontrol will occur, it is often difficult to compare econometric results on a year by year basis. However, most scenarios begin to converge by the third year after decontrol begins. Moreover, short term economic impacts do not occur instantaneously. It takes several years for the initial recessionary shock of the price increase to be fully registered. Therefore, the impact of decontrol will be calculated in terms of three year increments and we have estimated 3, 6 and 9 year impacts.

b. Standardized Impacts for Price Increases

Because price increases are the key to triggering the economic impact and because decontrol scenarios differ dramatically in the magnitude of the increase that they project, we have also calculated the impacts on a standardized basis. We have chosen to examine the impacts associated with a specific percent increase in prices.

In stating the impacts in the first three year period, we use estimates of the impact that would occur for a 100 percent increase in the first three years. That is, if prices double (increase by 100 percent) in the first three years, what will the impact be over the first three years?

However, for the six year and nine year impacts, we estimate the impact as a function of the five year price increase. That is, if prices double in the first five years, what will the impact be over the first six years? Similarly, if prices double in the first five years, what will the impact be in the first nine years? The reason the five year price increase is used to estimate the impacts of decontrol in the six and nine year periods is that all analyses exhibit only small real price increases after the first five years. That is, they are predicated on the assumption that early price shocks are working their way through the economy and no new price shocks are projected.

For the purposes of making the standardized estimate of impact (i.e., impact per 100 percent price increase), we have assumed that the impact is a linear function of price increases. For example, impacts estimated on the basis of a 68 percent price increase are scaled up to a 100 percent increase by dividing the impact by .68; impacts estimated on the basis of a 162 percent price increase are scaled down to a 100 percent price increase by dividing by 1.62. This may underestimate the impact of larger price increases since theory gives us some reason to expect increasing non-linear trends (i.e., larger increases have disproportionately larger impacts). The data do suggest a slightly increasing non-linear trend.

c. Full and Partial Decontrol

The analyses of full decontrol are treated separately from the analyses of partial decontrol. Full decontrol produces a different price path than partial decontrol, with price increases heavily concentrated in the early years. One would expect a different impact on the economy to result from these price paths, at least in the short term.

d. Modified Models

Because econometric models are not designed specifically to deal with energy price shocks, they may not simulate the economy's response to these price shocks with the same precision that they simulate the economy's "normal" operation. The Department of Energy has made efforts to alter the standard models (Wharton and DRI) to make them more sensitive to the economic responses that economic theory predict will occur when energy prices rise.[28]

Many of the adjustments are well-founded. That is, the models assume that the economy is more rigid than it actually is and, therefore, the models may over estimate the impacts. For purposes of comparison, the results of the econometric models in both their modified and unmodified forms have been included where they are available.

At the same time, it should be noted that one model utilized by DOE -- the Hudson/Jorgenson model -- is radically different from the other models.[29] It does not include a price-wage-price spiral, which is a major element of the other models. The exclusion of the price-wage-price spiral dampens the inflationary and other impacts compared to the other models and may lead to an underestimation of the impacts. This will become apparent when the results are reviewed.

The above steps, when applied to each of the available analyses, should lead to estimates of the impact of natural gas price increases that are comparable to one another.

e. An Adjusted Base Case

One additional methodological point should be made. All of the econometric analyses examine the impact of accelerating or expanding the decontrol of natural gas beyond the price increases that are programmed into the

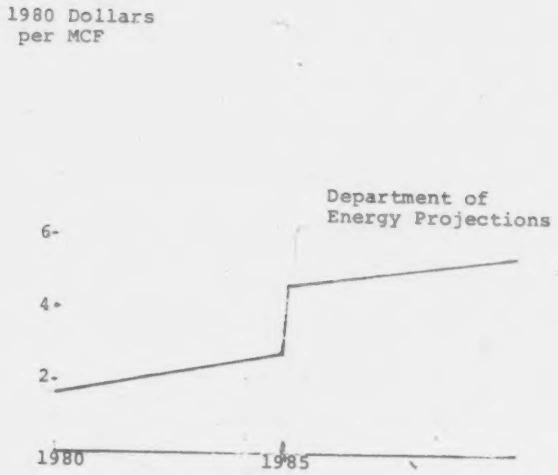
Natural Gas Policy Act. Therefore, the baseline against which accelerated decontrol is measured incorporates fairly steeply rising prices (see Figure 1). Rising prices such as these would have been negative economic impacts of their own. By focusing exclusively on accelerated and expanded decontrol, it becomes all too easy to overlook the overall economic impact of rising natural gas prices. If one focuses only on accelerated decontrol, one can quickly lose sight of the forest by looking at the trees.

For purposes of estimating the overall impact of rising natural gas prices on the economy, we have made rough estimates of what the model results would have been if they had been run with a base case that assumed flat real prices. This is not to suggest that flat real energy prices are to be expected. Rather, it is conventional in estimating the impact of price changes to measure them against a base case which assumes flat prices.

In the short term (3 years), we derive the adjusted estimate as follows: the impact of a 100 percent price increase is multiplied by 1.26, reflecting the fact that DOE projects a 26 percent real price increase in gas prices under NGPA.[30] The adjustment in the second three year period are based on econometric analysis done by DOE on the impact of NGPA compared to a flat price base case.[31] For longer periods no adjustment factor is available.

FIGURE 1

AVERAGE WELLHEAD PRICES UNDER THE NATURAL GAS POLICY ACT



Source: U.S. Department of Energy, A Study of Alternatives to the Natural Gas Policy Act of 1978 (Office of Policy, Planning and Analysis, Division of Energy Deregulation, November, 1981) p. 11.

4. Estimates of the Impact of Natural Gas Decontrol

a. Inflation

Table 5 presents estimates of the impact of decontrol on inflation as measured by changes in the GNP deflator.

i. Short Term

The estimates for the impact of natural gas price increases on inflation in the short run (3 year impact per 100 percent price increase) are quite consistent. That is, all estimates fall in a fairly narrow range. For partial decontrol the low estimate is an increase of 2.1 percentage points and the high estimate an increase of 3.4 percentage points. The average is 2.7 percentage points. The full decontrol analyses estimate similar impacts, although the average is slightly lower (+2.2 percentage points). This would be a function of the fact that three of the five models in the full decontrol analyses have been "modified" by DOE and would necessarily predict smaller impacts.

Thus, a range of 2.2 to 2.7 percentage points added to the rate of inflation for every 100 percent gas price increase over three years as a result of accelerated gas decontrol would seem reasonable. In other words, an average annual increase of between .7 and .9 percentage points in the GNP deflator can be expected for any decontrol scenario which doubles prices over a three year period. The midpoint of the range would be 2.5 percentage points over 3 years or .8 percentage points per year.

Table 5

ESTIMATION OF THE IMPACT OF NATURAL GAS DECONTROL ON INFLATION
(Measured by GNP Deflator)

	Price Changes (in %)		Change in Inflation (Percentage points)			Change in Inflation, Standardized Basis (per 100% price Increase)		
	3 yr	5 yr	3 yr	6 yr	9 yr	3 yr	6 yr	9 yr
NATURAL GAS								
Partial Decontrol								
Wharton[a]	228	237	+7.8	+4.8	+ .8	+3.4	+2.0	+ .4
DOE 1/DRI Partial[b]	103	160	+2.1	- .1	+ .1	+2.1	- .1	+ .1
DOE 2/DRI Partial Modified[c]	68	124	+1.8	+ .1	+ .1	+2.6	+ .1	+ .1
Average	133	174				+2.7	+ .7	+4.2
Adjusted to Flat Base						+3.3	+2.5	+ .2
Full Decontrol								
DOE 1/DRI[b]	165	217	+3.7	+1.2	+1.5	+2.2	+1.5	+ .7
DOE 2/DRI Modified[c]	112	130	+2.5	+1.9	+ .8	+2.2	+1.5	+ .6
DOE 2/DRI Modified[c]	112	130	+2.5	+1.9	+ .8	+2.2	+1.5	+ .6
DOE 2/Wharton (modified)[c]	112	130	+3.1	+ .3	+ .1	+2.8	+ .2	+ .1
DOE 2/HJ[c]	112	130	+1.6	- .2	- .3	+1.4	- .2	- .2
Average	122	147				+2.2	.7	+ .4
Adjusted to Flat Base						+2.7	+2.5	+ .4

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[a] Wharton Econometric Forcasting Associates, referenced in Dunn's Business Month, November, 1981.

[b] U.S. Department of Energy, Reducing U.S. Oil Vulnerability, November 10, 1980, Chapter II.

[c] U.S. Department of Energy, Macroeconomic Consequences of Natural Gas Decontrol, November 1981. Attachment 1 describes the Hudson/Jorgenson Dynamic General Equilibrium Model, referred to as DOE/HJ. Attachment 2 describes the DRI Model, referred to as DOE 2/DRI and the modifications to it. Attachment 3 describes the Wharton Model, referred to as DOE 2/Wharton, and the modifications to it.

ii. Long Term

In the longer term, the estimates become somewhat more varied. For example, the estimates of six year impacts of natural gas decontrol on inflation range from -.1 percentage points to +2.0 percentage points. The average is +.7 percentage points. Thus, the range is much wider compared to the mean. The same is true for the full decontrol analyses which have a range of -.2 to +1.5 percentage points. Here again, the mean is .7.

The six year impact analysis suggests that the impact of accelerated decontrol converges to the NGPA base. That is, the specific impact associated with accelerating decontrol and extending it to other categories of gas appears to have a large impact in the early years, but a smaller impact in the later years. This occurs because large price increases would occur in this period anyway due to the decontrol of gas prices programmed into NGPA. Over the first six years, the impact specific to changing NGPA would be about .11 percentage points per year added to the rate of inflation. This would be in addition to the impact of NGPA.

Thus, it is important to keep in mind that the total impact of rising natural gas prices would be larger than .11 percentage points. As the analysis adjusted to a flat base case shows, the total impact of rising gas prices would be to add about .5 percentage points to the rate of inflation every year for six years, cumulating to more than 2.5 percentage points.

In the nine year period, all the econometric models predict that the two price trajectories continue to converge. However, all but one of the models predict that the accelerated decontrol price path will remain above the NGPA price path. It would be considerably above a flat price path as Figure 1 indicates, although no estimate is available.

iii. Modified Models

It might be noted here that the modifications to the DRI model appear to have little impact on the estimates of the inflationary impact of rising natural gas prices. The Wharton model, which predicts large inflationary impacts, appears to be more affected by the modifications. On the other hand, the model which excludes a price-wage-price spiral (DOE, H/J) behaves rather differently than the other models. It predicts much smaller inflationary impacts. This outcome is an obvious, direct result of the assumption of no price-wage-price spiral.

b. Output

Table 6 presents the econometric estimates of the loss of output due to accelerated decontrol of natural gas. These results are generally as consistent as the results for inflation.

Table 6

ESTIMATION OF THE IMPACT OF NATURAL GAS DECONTROL ON OUTPUT

(Measured as Change in GNP Deflator)

	Price Increase		Change in GNP			Change in GNP Standardized Basis (per 100% price Increase)		
	3 yr	5 yr	3 yr	6 yr	9 yr	3 yr	6 yr	9 yr
Partial Decontrol								
Wharton	228	236	+2.0	- .8	- .4	- .9	- .3	- .2
DOE 1/DRI	103	160	-2.5	-1.7	-1.6	-2.4	-1.1	-1.0
DOE 2/DRI	68	124	- .8	- .1	- .1	-1.2	- .1	- .1
DOE 2/HJ	68	124	- .6	- .1	+ .4	- .9	- .1	+ .3
Average						-1.35	- .4	- .3
Adjusted to Flat Base						-1.67	-3.2	- .2
Full Decontrol								
DOE 1/DRI	165	217	-4.9	-4.0	-3.4	-3.0	-1.8	-1.6
DOE 2/DRI (unmodified)	112	130	-1.5	-1.1	-1.8	-1.3	- .8	-1.4
DOE 2/DRI (modified)	112	130	-1.4	- .9	-1.3	-1.3	- .7	-1.0
DOE 2/Wharton (modified)	112	130	-1.0	- .8	- .9	- .9	- .6	- .7
DOE 2/HJ	112	130	- .7	- .3	+ .2	- .6	- .2	+ .2
Average						-1.3	- .8	- .9
Adjusted to Flat Base						-1.6	-3.6	- .9

Source: See Table 5.

i. Short Term

On average, GNP is predicted to be 1.35 percent lower during the first three years of accelerated decontrol (about .4 percent lower per year), if the price increase is 100 percent in those three years. The range of estimates is fairly narrow: -.9 to -2.47 percent for partial decontrol and -.6 to -3.0 percent for full decontrol. If an adjustment to a flat base case were made, the loss in GNP would be somewhat larger. The loss in GNP adjusted to a flat base would be between 1.6 and 1.7 percent.

ii. Long Term

The models predict a pattern of changes in output in the second period that is similar to that which held for the behavior of the impact on inflation. Accelerated decontrol converges toward NGPA because NGPA triggers price increases of its own in the second three years. However, the aggregate level of output under accelerated decontrol remains below that of NGPA. Moreover, when the level of output is compared to a flat price trajectory, the loss in GNP due to rising gas prices is quite large. It is 3.2 to 3.6 percent in the aggregate or about .6 percent per year.

The longer term behavior of output is similar to that of inflation. The decontrol and NGPA paths continue to converge in the third three year period. However, note that they converge less rapidly. That is, the negative impact on GNP lingers longer and is larger than the inflationary impact. For example, by the third period between eight and nine tenths of the inflationary impact had worked its way out of the economy. That is, for partial decontrol, +.3 percentage points remain in the third period out of a +2.7 percentage point impact in the first three years. For full decontrol, +.4 out of +2.2 percentage points for full decontrol. For GNP, less of the impact has been mitigated. Only between three-tenths and six-tenths of the impact has worked its way out of the economy by the third three year period (-.3 percent remains in the third period out of -1.35 percent in the first period for partial decontrol and -.9 out of -1.3 percent for full decontrol).

c. Unemployment

Table 7 presents the estimates of the increase in unemployment that will result from accelerated decontrol. These are the most consistent of the three impacts reviewed here. The range of estimates is the narrowest by far.

i. Short Term

In the short term (3 years) accelerated decontrol reasulting in a 100 percent price increase is estimated to increase the rate of unemployment by .5 percentage points -- or .17 percent per year. The range is from .3 to .7 percentage points in the partial decontrol analyses and .3 to .9 percentage points for the full decontrol analyses. If the estimate is adjusted to a flat base, the overall

Table 7

ESTIMATION OF THE IMPACT OF NATURAL GAS DECONTROL ON UNEMPLOYMENT

(Measured by Changes in the Unemployment Rate)

	Price Changes (in %)		Change in Unemployment (Percentage points)			Change in Unemployment Standardized Basis (per 100% price Increase)		
	3 yr	5 yr	3 yr	6 yr	9 yr	3 yr	6 yr	9 yr
Partial Decontrol								
Wharton	228	236	+1.1	+ .6	+ .4	+ .5	+ .3	+ .2
DOE 1/DRI Partial	103	160	+ .7	+ .2	+ .2	+ .7	+ .1	+ .1
DOE 2/DRI	68	124	+ .3	+ .4	+ .3	+ .4	+ .3	+ .2
Average						+ .5	+ .2	+ .2
Adjusted to Flat Base						+ .6	+1.1	+ .2
Full Decontrol								
DOE 1/DRI	165	217	+1.5	+ .8	+ .7	+ .9	+ .4	+ .3
DOE 2/DRI (unmodified)	112	130	+ .5	+ .3	+ .3	+ .4	+ .2	+ .2
DOE 2/DRI (modified)	112	130	+ .5	+ .3	+ .3	+ .4	+ .2	+ .2
DOE 2/Wharton (modified)	112	130	+ .3	- .1	0	+ .3	- .1	0
Average						+ .5	+ .2	+ .2
Adjusted to Flat Base						+ .6	+1.1	+ .2

Source: See Table 5.

increase in unemployment would be about .6 percentage points, or about +.2 percentage points per year.

ii. Longer Term

In the longer run, the pattern of convergence between NGPA and decontrol is observed again. The unemployment associated with accelerated decontrol is +.2 percentage points in the second three year period and +.2 percentage points in the third three year period. As was the case for the loss of output, a large part of the initial negative impact (four-tenths) remains through the third period. Adjusted to a flat base, the impact is a sustained +.2 percent per year for the first six years.

d. Conclusion

i. Long Term

Any conclusion about the macroeconomic effects of natural gas decontrol should begin with an observation about the longer term impacts. We have remarked that the specific impact of accelerated decontrol "declines" relative to the NGPA base in the longer term because NGPA embodies larger price increases of its own. This observation may be seriously misleading if not kept in proper perspective. Above all, the large and significant impact of rising gas prices stemming from NGPA itself must not be overlooked.

Compared to a base case of constant real gas prices, accelerated decontrol produces a constant pattern of negative economic impacts over all of the six years for which analysis is available. It would certainly produce this pattern for more than a decade.

As Table 8 shows, the inflationary impacts are very sharp in the first three years and then decline in the second three years. From a level of 1.1 percentage points per year, inflationary impacts would drop to .4 percentage points spread over six years. However, the GNP and unemployment impacts do not decline in the second three years. One can expect GNP to be reduced by about .6 percent each year for the first six years, while unemployment will be increased by .2 percentage points per year. These are impacts per 100 percent price increase. The actual price increases are likely to be larger. The average three year increase projected by the studies reviewed above would be close to 130 percent and the five year increase would be close to 175 percent.

Thus, an excessive concern with the isolation of the specific impact of accelerated decontrol may lead to a misunderstanding of the underlying issue of the overall impact of rising energy prices on the economy. Rising natural gas prices on an accelerated path will lead to sustained negative impacts that will affect the economy for the next decade in much the same fashion as the oil price shock of the past decade. For the first six years, the rate

Table 8

THE AVERAGE ANNUAL IMPACT OF RISING NATURAL GAS PRICES CALCULATED AGAINST A FLAT BASE

	First 3 Years	First 6 Years
Inflation		
Partial	+1.1	+ .4
Full	+ .9	+ .4
GNP		
Partial	- .6	- .5
Full	- .5	- .6
Unemployment		
Partial	+ .2	+ .2
Full	+ .2	+ .2

Source: Calculated from Tables 5-7.

of inflation would be raised by +.7 percentage points per year, GNP would be decreased by more than 1 percent per year and unemployment would be increased by .35 percentage points per year.

This observation suggests that the real focus of the analysis of accelerated decontrol should be on the short term. That is, DOE has recently concluded that the short term impacts of accelerated decontrol are bad but that the long term impacts are only slightly worse than NGPA. What this is really saying is that the long term economic future will be dimmed by rising gas prices due to NGPA and that accelerated decontrol, if it is pushed through, will dim the near term economic future as well. In other words, after 1985, NGPA will depress the economy. The real issue is whether the impact will be started earlier by accelerating decontrol and increased by extending decontrol to more categories of natural gas.

ii. Short Term

Turning to the short run, Table 9 presents a number of perspectives on the estimates of the impact of decontrol of gas prices. The analysis focuses on accelerated decontrol, as opposed to immediate, full decontrol. The mean estimate and the range of estimates for the accelerated decontrol analyses are shown. In addition, the mean for full decontrol analyses is shown. Finally, an estimate

Table 9

ESTIMATES OF THE SHORT RUN IMPACT OF ACCELERATED DECONTROL

	Phased Decontrol Analysis			Mean of Full Decontrol Analysis	Adjusted Mean of Oil Analysis
	Mean	Low	High		
Inflation (percentage points)	+2.7	+2.1	+3.4	+2.2	+2
Output (percent)	-1.35	- .9	-2.4	-1.3	-1.27
Unemployment (percentage pts)	+ .5	+ .3	+ .9	+ .5	.6

Source: Calculated from Tables 5-7 and Appendix B.

based on the earlier oil analysis is presented. The calculation of the estimate derived from the oil analysis is described in Appendix B.

In the short term, the mean of the partial decontrol estimates is well within the limits of all the other estimates. Further, the range is quite narrow. Thus, if one chooses the mean, the series of analyses lead to estimates in which one can have considerable confidence.

Having settled on a basic impact estimate -- i.e., impact per 100 percent price increase -- we must next settle on the size of the expected price increase. That is, all of the analysis in this section is based on a 100 percent price increase over the first three years. In an earlier report, CECA/RF has estimated that a three year phased decontrol would lead to a 133 percent price increase.[32] In addition, it turns out that this is the mean of the estimates contained in the analyses reviewed above. Thus, the standard impacts estimated above should be scaled up by a factor of 1.33.

The resulting estimate for the short term would be an increase of 3.6 percentage points in the GNP deflator, a decrease of 1.9 percent in GNP and an increase of .7 percentage points in unemployment. Furthermore, based on the earlier estimates we can project that the impact on the CPI will be 1.5 times as great as the impact on the GNP deflator. Therefore, the CPI would increase by about 5.4

percentage points. These are three year impacts, so that the average annual impact would be as follows:

GNP Deflator	+1.2 percentage points
CPI	+1.8 percentage points
Unemployment	+ .2 percentage points
GNP	- .6 percent

Given what we have noted above with respect to the overall impact of gas prices, we would expect the unemployment and GNP impacts to continue at about the same level for the mid-term at least. The inflationary impact would recede in the second three year period.

FOOTNOTES

[1] Basic, technical discussions of the impact of energy prices can be found in the following articles: R.J. Gordon, "Alternative Responses of Policy to External Supply Shocks," Brookings Papers on Economic Activity 1 (Washington, DC: The Brookings Institute, 1975); E. Phelps, "Commodity Supply Shocks and Full Employment Monetary Policy," Journal of Money Credit and Banking 10, No. 2 (1978); William Nordhaus, "Oil and Economic Performance in Industrial Countries," Brookings Papers on Economic Activity 2 (1980). Somewhat more accessible discussions can be found in Robert S. Dohner, "Energy Prices, Economic Activity and Inflation; a Summary of Issues and Results," in Energy Prices, Inflation and Economic Activity, K. Mork, ed. (Cambridge: MIT Press, 1981); Robert S. Gordon, "Postwar Macroeconomics: The Evolution of Events and Ideas," in The American Economy in Transition, ed. Martin Feldstein (Chicago: Chicago University Press, 1981).

[2] The benefits of accommodative responses have been noted by Gordon, Phelps, op. cit., as well as E. Gramlich, "Macro Policy Responses to Price Shocks," Brookings Papers on Economic Activity 1 (Washington, DC: The Brookings Institute, 1979); K. Mork and R. Hall, "Macroeconomic Analysis of Energy Price Shocks and Offsetting Policies; an Integrated Approach," in K. Mork, Energy Prices.

[3] U.S. Department of Energy (Macroeconomic Consequences of Natural Gas Decontrol [Washington, DC: Government Printing Office, 1981], p. 23) notes interest rates explicity as do Thurman and Berner, "Analysis of Oil Price Shocks in the MPS Model," in K. Mork, Energy Prices.

[4] Empirically, estimates typically vary by a factor of two in the magnitude of projected impacts. Nordhaus, ("Oil and Economic Performance," p. 346) states that the impact may last from one to four decades for the long run.

[5] The impact of rising energy prices on productivity has received considerable attention. Discussion of specific aspects of this impact by those who estimate small impacts can be found in George L. Perry, "Potential Output: Recent Issues and Present Trends," Brookings Reprint 336 (Washington, DC: The Brookings Institute, 1978); E. Denison, "Explanations of Declining Productivity Growth," Survey of Current Business 59 (1979); William Fellner, "The Declining Growth of American Productivity: An Introductory Note," in Nordhaus, ed. Contemporary Economic Problems (1979).

Those who estimate the impact of rising energy prices to be large include R. Rasche and J. Tatom, "Energy Prices and Potential GNP" and "The Effects of the New Energy Regime and Economic Capacity, Production and Prices," Federal Reserve Bank of St. Louis Review (1977); Dale W. Jorgenson, "Energy Prices and Productivity Growth," Data Resources Inc. (1979); E.A. Hudson and D.W. Jorgenson, "Energy Prices and the U.S. Economy 1972-1976," Natural Resources Journal 18 (1978); J. Tatom, "Energy Prices and Capital Formation" and "The Productivity Problem," Federal Reserve Bank of St. Louis Review (1979); Martin Neil Baily, "Productivity and the Services of Capital and Labor," Brookings Paper on Economic Activity 1 (1981).

[6] There is little disagreement on the conceptual causes of declining productivity. Rather, the disagreement centers on the elasticity of substitution between energy and other factors of production which leads to disagreement about how big the impact is and how long it lasts. An interesting exercise to demonstate the striking difference in the impact on GNP depending on the assumptions made about the elasticity of substitution has been conducted by W. Hogan and Alan Manne, "Energy-Economic Interactions: The Fable of 'The Elephant and the Rabbit'," in Advances in the Economics of Energy and Resources: The Structure of Energy Markets, Volume I, ed. Robert S. Pinlyck (Connecticut: JAI, 1979).

[7] Kenneth Arrow and Joseph Kalt (Petroleum Price Regulation: Should We Decontrol? [Washington, DC: American Enterprise Institute, 1979]) establish an analytic framework for studying efficiency gains. Glenn C. Loury (An Analysis of the Efficiency and Inflationary Impact of the Decontrol of Natural Gas Prices [Washington, DC: Natural Gas Supply Association, April 1981]) applies the argument to natural gas, as does DOE, Two-Market Analysis of Natural Gas Decontrol (Washington, DC: Government Printing Office, November 1981). Rodney T. Smith ("In Search of 'Just' U.S. Oil Policy: A Review of Arrow, Kalt and More," Journal of Business 54 [1981]: 11) takes the Arrow/Kalt approach but reaches rather different conclusions than they did about the most equitable policy.

[8] Subcommittee on Oversight and Investigations of the Committee on Interstate and Foreign Commerce, United States House of Representatives, The Energy Inflation Crisis: Sources, Consequences and Policy Options (Washington, DC: Goverment Printing Office, December 1980), p. 13.

[9] DOE, The Interrelationship of Energy and the Economy: A Supplement to the National Energy Policy Plan (Washington, DC: Government Printing Office, July 1981).

[10] Ibid.

[11] Idid., p. 23. See also, Otto Eckstein, "Shock Inflation, Core Inflation and Energy Disturbances" in E. Mork, ed., Energy Prices, pp. 78-79.

[12] DOE, *The Interrelationship*, p. 24; Eckstein, "Shock Inflation," pp. 78-79.

[13] See Denison, "Explanations;" Tatom, *Energy Prices* and Baily, "Productivity."

[14] See DOE, *The Interrelationship*, pp. 21-23 and Eckstein, "Shock Inflation," pp. 78-79.

[15] DOE, *The Interrelationship*, p. 19 and Eckstein, "Shock Inflation," pp. 78-79.

[16] DOE, *The Interrelationship*, p. 6 and Nordhaus, "Oil and Economic Performance," p. 370.

[17] U.S. Executive Office, *Economic Report of the President, 1981* (Washington, DC: Government Printing Office, January 1981), p. 51.

[18] Ibid., p. 190. Similarly, Mork and Hall, *Macroeconomic Analysis*, show that accommodative policies can easily absorb half of the macroeconomic impact of the price shock.

[19] Otto Eckstein (*The Great Recession: With a Postscript on Stagflation* [New York: North Holland, 1978], p. 5) has called econometric modeling "an exercise in contemporary cliometrics." Cliometrics can be defined as the study of economic history through the construction of quantitative, contrafactual scenarios which test the causal importance of specific historical facts. For example, *if* there had been no energy price increase in 1979-80, what would the course of economic activity have been. Cliometrics, as an approach to economic history, has been the subject of considerable controversy. One of the most important controversies centers on the specification of the counterfact to be tested. If one specifies the incorrect counterfact, the analysis loses its logical basis (see, for example, Stefano Fenoalta, "The Discipline and Theory: Notes on Contrafactual Methodology and the New Economic History," *Journal of European Economic History*, 2:3. In this case, the failure to take account of monetary policy may be a misspecification of the counterfact if energy prices and restrictive monetary policy are inseparable.

[20] Eckstein, *The Great Recession*, Chapter 9 and DOE, *The Interrelationship*, Tables 2 and 3.

[21] DOE, *The Interrelationship*, Tables 2 and 3.

[22] Ibid.

[23] Ibid., pp. 19-22.

[24] The Consumer Energy Council of America Research Foundation, Crude Oil Price Decontrol and the Poor: A Social Policy Failure, prepared for the Subcommittee on Investment, Jobs and Prices of the Joint Economic Committee, February 1982, Table II-4.

[25] Consumer Energy Council of America Research Foundation, Past as Prologue I: The Underestimation of Price Increases in the Decontrol Debate: A Comparison of Oil and Natural Gas (Washington, DC, February 1982).

[26] This assertion is derived by taking a weighted average of the elasticities of natural gas in its two primary end use categories -- residential and industrial -- and comparing it to the weighted average of the elasticities of oil in its three primary end use categories -- residential, industrial and transportation. The data are taken from Lester D. Taylor, "The Demand for Energy: A Survey of Price and Income Elasticities," in William D. Nordhaus, ed., International Studies of the Demand for Energy (New York: North Holland, 1977) and Robert S. Pindyck, The Structure of World Energy Demand (Cambridge: MIT Press, 1979). The only two sources that estimated the elaslticities for the full range of uses of each fuel yield the results contained in the following table, which leads to the conclusion that the aggregate elasticities of oil and natural gas are roughly equal. Other studies show essentially the same relationship between the two fuels, but they do not cover the full range of end-uses of each of the fuels.

	Federal Energy Administration[a]	Pyndick[b]
OIL		
Residential	- .07	-1.10 to 1.38
Industrial	-1.01	-1.03 to -1.117
Private Gasoline	- .49	-1.03
GAS		
Residential	-1.26	-1.28 to -2.09
Industrial	- .58	- .41 to - .67
Average		
Oil	- .70	-1.06
Gas	- .85	- 1.09

[a] Federal Energy Administration, National Energy Outlook: 1976 (February 1976), as described in Taylor, pp. 21, 24, 32.

[b] Pyndick, pp. 16, 222, 241.

[27] Data from the American Petroleum Institute (Market Shares and Individual Company Data, 1950-1979, October 30, 1980) shows that the 16 largest owners of crude oil reserves possess 67 percent of all domestic reserves. The same 16 companies own 50 percent of all domestic gas reserves. As for the closeness of technology, we need only note that industry sources treat oil and gas drilling as virtually identical when they discuss the allocation of rigs between the two fuels. As for the geographic concentration of production, we can note that five states (Oklahoma, Texas, Louisiana, New Mexico and California) accounted for 64 percent of all domestic oil production in 1980 and 82 percent of all gas production in 1979. These states constitute less than 20 percent of the total area of the U.S.

[28] The modifications entail (1) adjusting potential GNP upward in the DRI model to reflect DOE's assumption of reduced real resource costs in acquiring the same quantity of gas (see page __ above) and (2) altering the input/output matrix in the Wharton model to allow for increased consumption of natural gas in the industrial sector when decontrol occurs, reflecting DOE's argument that industrial users were held below their optimum consumption of gas by curtailments and other restrictions (Fuel Use Act).

[29] See Consumer Energy Council of America Research Foundation, Natural Gas Price Deregulation: A Case of Trickle-Up Economics for a full description of one of the major differences.

[30] DOE, Two Market Analysis of Natural Gas Decontrol (November 1981) Attachment IV.

Appendix A

THEORETICAL EFFICIENCY GAINS AND LOSSES FROM DECONTROLLING ENERGY PRICES

A. Introduction

Since early 1979, the discussion of the decontrol of energy prices has become increasingly rigorous and theoretical. A number of authors have attempted to conceptualize the potential benefits and costs of decontrol.[1] Unfortunately, the conceptualizations are frequently difficult to reconcile. Some authors address only certain potential benefits, others address only certain costs. Some only analyze the energy sector. Others address only non-energy sectors.

Amid this confusion, the misconception has been created that decontrol, of necessity, leads to efficiency gains in the economy. In fact, that is not the case. Although there is a high likelihood that there will be some efficiency gains in the domestic energy sector, and some possibility that there will be resource gains in the international sector, there is also a very high likelihood that there will be resource and efficiency losses in domestic non-energy sectors. Theory is completely silent on whether the gains will be larger than the losses.

The ultimate impact of decontrol depends on a number of empirical, not theoretical, issues. What is the magnitude of the price elasticity of supply and demand for energy?

What is the elasticity of substitution between energy and other inputs (factors of production)? The bulk of the empirical evidence suggests that the bottom line impact on efficiency is negative, not positive. Thus, the belief that decontrol leads to efficiency gains in the economy is not only theoretically unfounded, it appears to be empirically incorrect as well.

Several of these issues have been addressed in earlier studies conducted by the Consumer Energy Council of America Research Foundation.[2] In this Appendix, we present a brief, preliminary, formal discussion of the subject. The objective is to stimulate further careful thinking about the efficiency implications of decontrol and, thereby, to clear up some of the confusion.

B. Efficiency Gains in the Energy Sector

1. Arrow/Kalt: Markets at Equilibrium with Inefficiencies

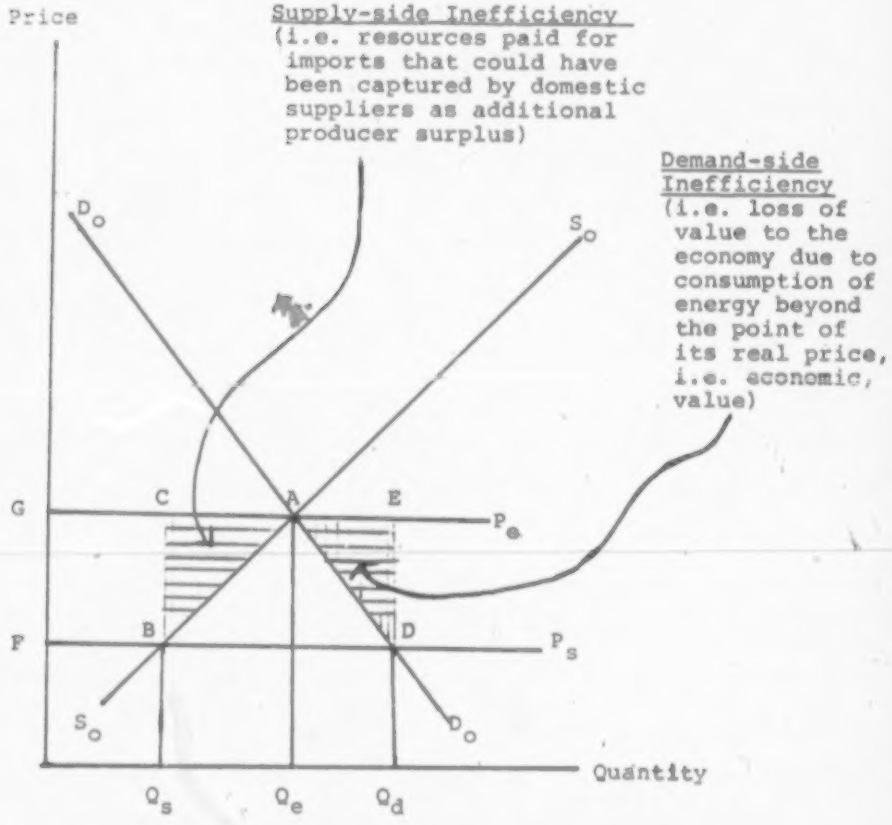
The basic lines of discussion of efficiency gains seem to have been laid down by Arrow and Kalt. They identified two potential gains from decontrol. According to their argument, controlled or subsidized prices lead suppliers to produce less and consumers to demand more energy than they would at decontrolled prices. Two types of inefficiency resulting from controls and, therefore, two potential efficiency gains from decontrol can be identified. Throughout the analysis we use the terms inefficiency (due to controls) and efficiency gains (potentially achievable with decontrol) interchangably.

Supply side inefficiency is defined as the difference between the price we pay (P_w) for supplies of energy in excess of the quantity of energy (Q_s) domestic suppliers are willing to produce at the controlled price (P_s) and the domestic resources that would have been utilized domestically to produce that energy (see Figure A.1). This is the area contained in triangle ABC. That is, the price we pay for energy is a world price, but the marginal cost of domestically produced energy is defined by the supply curve (S_oS_o). The difference is a potential efficiency gain. We can decrease the import bill and hold the resources in the domestic economy by allowing the price to rise to the world level. This shift of resources is tantamount to an increase in domestic producer surplus (as classically defined).[3] Consumer surplus is unaffected.

Demand side inefficiency is defined as the difference between the price actually paid for energy and the value that consumers place on energy. This is the area in triangle ADE. That is, because consumers "see" a price that is lower than the nation actually pays, they consume energy beyond that point where its utility (expressed in the demand curve [D_oD_o]) would justify that consumption at the real price. The difference between the world price of energy and its utility is a potential efficiency gain. However, note that if captured through decontrol, this efficiency gain would

FIGURE A.1

ARROW/KALT: BASIC SUPPLY AND DEMAND-SIDE POTENTIAL EFFICIENCY GAINS



Supply-side Inefficiency (i.e. resources paid for imports that could have been captured by domestic suppliers as additional producer surplus)

Demand-side Inefficiency (i.e. loss of value to the economy due to consumption of energy beyond the point of its real price, i.e. economic value)

Source: Kenneth J. Arrow and Joseph P. Kalt, Petroleum Price Regulation: Should We Decontrol? (Washington, D.C., American Enterprise Institute, 1979), pp. 9-27.

cause a decline in consumer surplus, as classically defined.[4] The loss would be equal to the area bounded by ADFG.

2. Arrow/Kalt: More Supply Side Inefficiencies

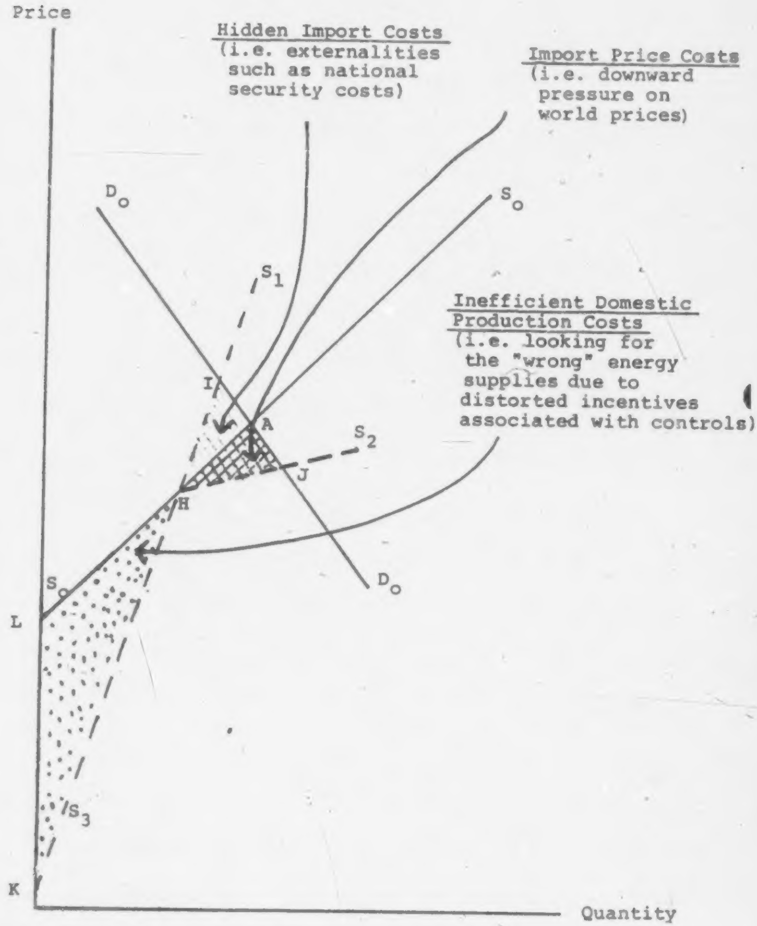
These were the basic efficiency gains that Arrow/Kalt discussed and quantified carefully. However, they also noted other potential gains (see Figure A.2). If the import price does not reflect the full social cost of imports (e.g., if there are external costs of imports such as national security costs) then the world price is "too low." The import supply curve is really defined by HS_1. The potential efficiency gains can be measured as the area of triangle AHI. This inefficiency can be called the hidden import costs.

At the same time, they note that increased domestic supplies and decreased demand could put downward pressure on the world price of energy. The import supply curve could be HS_2. The potential efficiency gains can be measured by the triangle AJH. This inefficiency can be called import price costs.

On the other hand, if domestic controls give incentives to look for energy in the wrong places (e.g., low production stripper wells or high cost deep gas), then the cost of domestic gas is higher than it should be. The domestic supply curve shifts to S_3H. The potential efficiency gains can be measured as the area of the triangle HKL. This inefficiency can be called inefficient domestic production cost.

FIGURE A.2

ARROW/KALT: ADDITIONAL SUPPLY-SIDE EFFICIENCY GAINS, HIDDEN IMPORT COSTS AND INEFFICIENT DOMESTIC PRODUCTION COSTS


Price
Hidden Import Costs
(i.e. externalities such as national security costs)
Import Price Costs
(i.e. downward pressure on world prices)
D_o
S_o
S_1
Inefficient Domestic Production Costs
(i.e. looking for the "wrong" energy supplies due to distorted incentives associated with controls)
I
A
S_2
J
H
D_o
S_o
L
S_3
K
Quantity

Source: Kenneth J. Arrow and Joseph P. Kalt, Petroleum Price Regulation: Should We Decontrol? (Washington, D.C., American Enterprise Institute, 1979), pp. 9-27.

The administrative costs associated with controls can also be conceptualized in this way. That is, if we assume that the administrative costs of control are passed through to consumers , they appear as an "artificially" high supply curve.

With decontrol, the hidden import costs and import price costs would be registered as consumer surplus gains, if they were captured. The inefficient domestic production costs would be registered as increases in producer surplus.

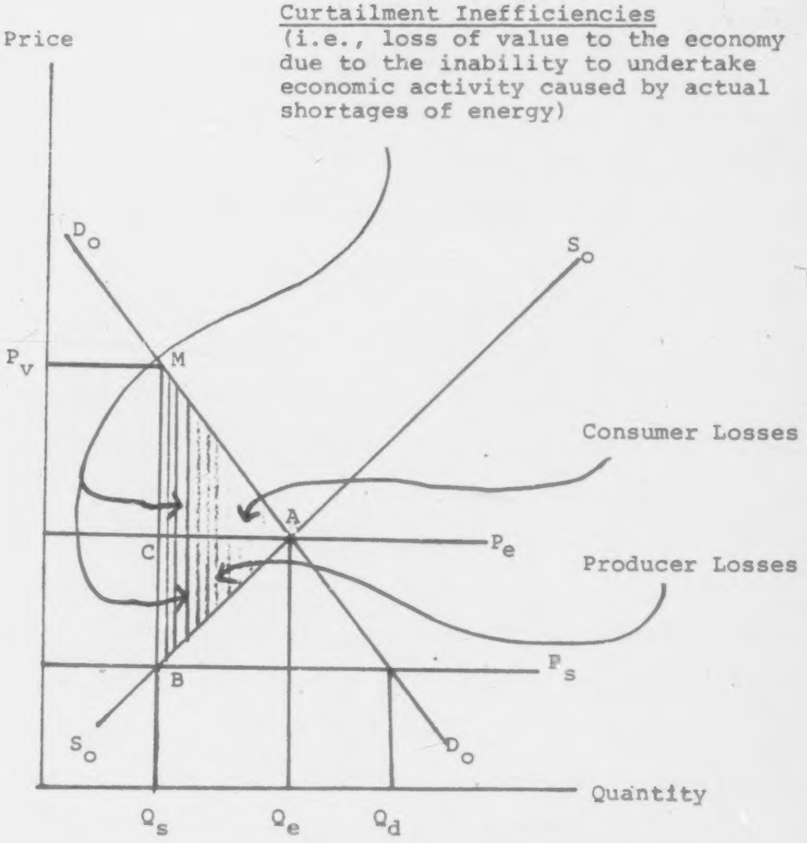
2. Loury: Shortages

From this base, a number of additions and modifications have been made. Note that Arrow and Kalt assume that the market clears by increasing imports. They measure gains primarily by avoided import costs. However, what if the market doesn't clear? What if some consumers are actually denied energy? Loury has taken a step toward dealing with this situation (see Figure A.3). He argues that if there is a physical shortage, the value of the loss to the economy is equal to the value of consumption (i.e., the height of the demand curve D_oD_o) minus the cost of producing the energy (the height of the supply curve S_oS_o). This area is given by the triangle ABM. Loury argues as follows:

> As may be seen in the Figure, the ceiling price control-induced shortfall of production below the equilibrium level creates a situation where the value of an additional unit of gas to demanders, P_v, exceeds the cost to suppliers of producing another unit, P_s. The difference $P_v - P_s$ is thus the potential net gain from another unit of production beyond Q_s. As production is further expanded beyond

FIGURE A.3

LOURY: POTENTIAL CURTAILMENT EFFICIENCY GAINS



Source: Glenn C. Loury, An Analysis of the Efficiency and Inflationary Impact of the Decontrol of Natural Gas Prices (Natural Gas Supply Association, April, 1981), p. 2.

> Q_s, the marginal cost of additional supplies rises, and the marginal value of additional units consumed falls. These marginal values are equalized at the market clearing quantity Q_e. The shaded area in the Figure thus represents the net efficiency cost of price controls because, for each unit of production in excess of Qs, the height of the demand curve represents the value of benefits from consuming that unit while the height of the supply curve represents the cost of producing that unit. The difference is thus the net social gain from having that unit available. The shaded triangular area then depicts the sum of net social gains foregone by virtue of the shortfall of production from Q_e to Q_s. It therefore also represents the efficiency benefits which could be enjoyed if controls were removed.

We can call this curtailment inefficiency.

With decontrol, those gains captured in the area between the world price and the demand curve (ACM) would be realized as gains in consumer surplus. They are measured as the utility (surplus) lost by consumers who are constrained from using resources up to their optimum quantity Q_e.

The gains between the world price and the supply curve (ABC) would be registered as increases in producer surplus. They can be defined roughly as in the Arrow/Kalt scheme. That is, they are the value (surplus) that producers could realize if prices were allowed to rise to P_w.

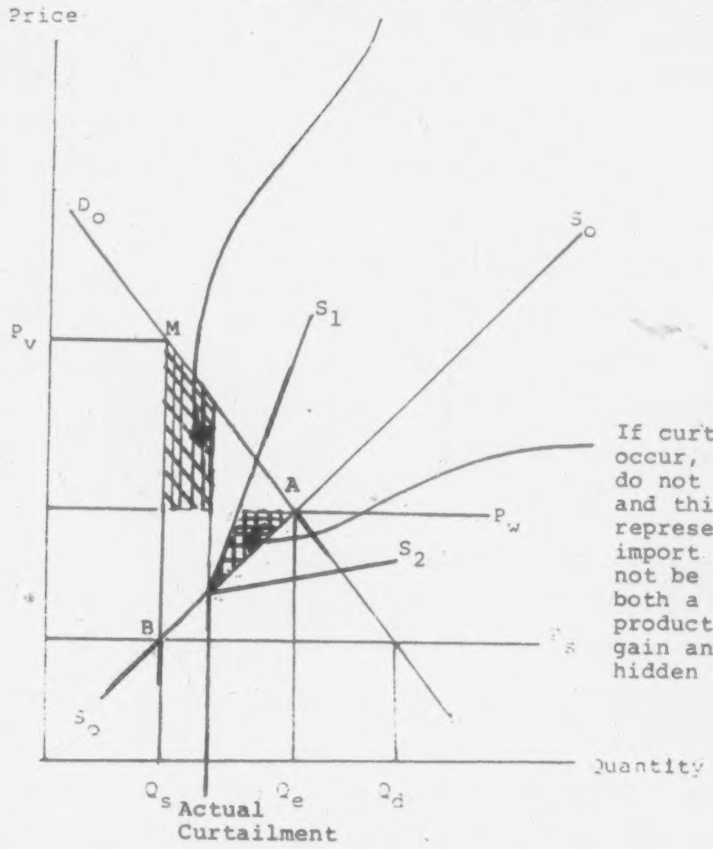
Unfortunately, the remainder of Loury's analysis becomes confused. Having talked of actual physical shortages, he then talks of import reductions (the Arrow/Kalt point). But if one has shortages, how are imports to be reduced? Additions to supply will fill unsatisfied demand, not displace imports. Only if oil is not a substitute for some uses of gas can there be both curtailment efficiency gains and import reductions. If that is the case, one must be extremely careful in counting efficiency gains. If one counts the full Arrow/Kalt efficiency gains and the full Loury efficiency gains, then one must be double counting some gains. That is, the inefficiency attributable to physical shortage, and the inefficiency attributable to imports, are mutually exclusive.

Loury's calculations of efficiency gains are problematic and ambigious on this point (see Figure A.4). He counts the full curtailment gains first. However, the curtailments he calculates are about 2 TCF. This is far above actual curtailments in 1980. Thus, his theoretical argument does not fit reality. That is, he conceptualizes and measures the area of ABM, but, in reality, physical shortages were not that large.

What is more, Loury then counts import reduction gains. However, he values these only at their premium above the world price of oil. The premium he puts on the import savings is quite high, $10 per barrel. If the $10/barrel figure is intended strictly as an avoided import price cost, then no double counting has occurred. However, $10/barrel is a very high reduction in import prices to predict and Loury's discussion suggests that the premium he has in mind is both a hidden import cost saving and an import price saving. If that is the case, then there is some double counting. You can't have both a hidden import cost gain and a curtailment efficiency gain of the magnitude Loury calculates. If there are curtailments of the order of magnitude he estimates, there will be much smaller import reductions.

FIGURE A.4

LOURY: AMBIGUITIES IN CALCULATING EFFICIENCY GAINS


Price
D
o
S
o
S
1
P
v
M
A
P
w
S
2
B
P
s
S
o
Quantity
Q
s
Q
e
Q
d
Actual
Curtailment

If curtailments do not actually occur, then this area is not a potential efficiency gain.

If curtailments do occur, then imports do not close the gap and this area, representing hidden import costs, must not be counted as both a domestic production efficiency gain and an avoided hidden import cost.

Source: Glenn C. Loury, *An Analysis of the Efficiency and Inflationary Impact of the Decontrol of Natural Gas Prices* (Natural Gas Supply Association, April, 1981), pp. 2-10.

The ambiguity is of potentially large significance. The import-related efficiency gains in Loury's analysis are by far the most important. If import price savings are only half the import gains Loury had in mind, then almost one-quarter of the total gains Loury estimated are a result of double counting.

Loury could calculate all Arrow/Kalt gains first and then add some curtailment gains, but it seems clear that the total gains would be much smaller than he originally estimated.

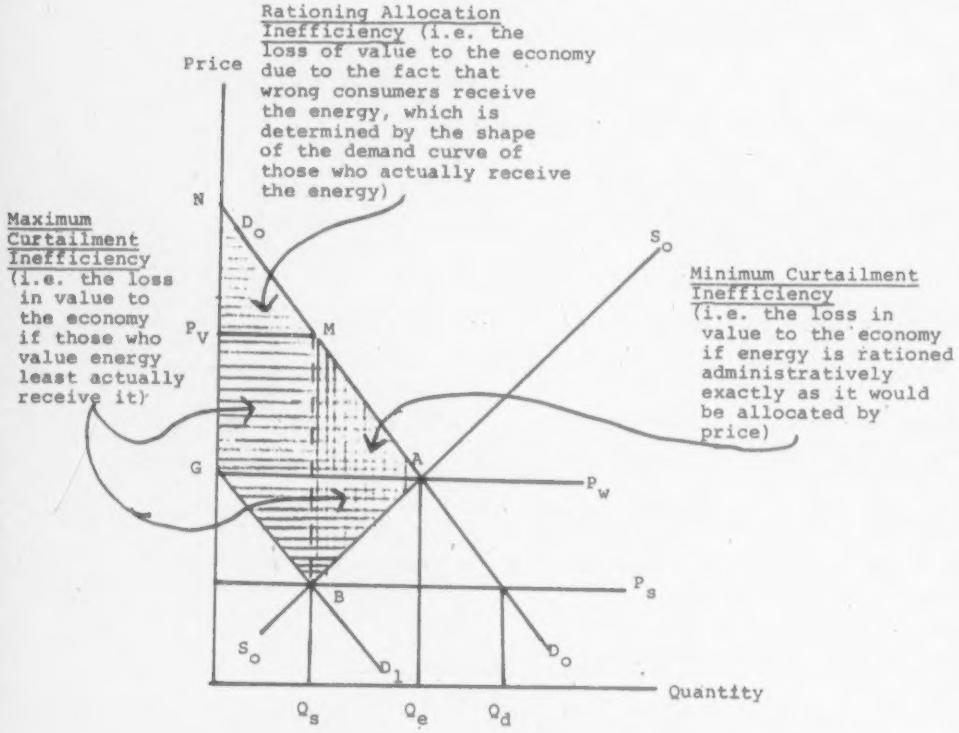
Finally, Loury mentions the fact that, where curtailments actually occur and supply is rationed administratively, there is no guarantee that those who value gas most will have access to it. Therefore there are potentially more inefficiencies in a market in which shortages exist. However, he does not conceptualize this effect.

3. Felmy: Shortages with Misallocation

Felmy follows Loury's approach, but avoids his error. He also conceputalizes the rationing effects about which Loury mused (see Figure A.5). Again, efficiency gains are measured as the difference between the cost of production and the value of consumption -- the area between the supply and demand curves, triangle ABM. Felmy calls this the minimum efficiency gain (we call it minimum curtailment inefficiency). Felmy goes on to conceptualize the potential rationing inefficiency of curtailments. Suppose that those who have access to gas under the rationing scheme are those who value it least. Their demand curve would be given by D_1D_1, not D_oD_o and the value of the

FIGURE A.5

FELMY: POTENTIAL RATIONING ALLOCATION EFFICIENCY GAINS


Rationing Allocation Inefficiency (i.e. the loss of value to the economy due to the fact that wrong consumers receive the energy, which is determined by the shape of the demand curve of those who actually receive the energy)
Price
N
D_o
S_o
Maximum Curtailment Inefficiency (i.e. the loss in value to the economy if those who value energy least actually receive it)
Minimum Curtailment Inefficiency (i.e. the loss in value to the economy if energy is rationed administratively exactly as it would be allocated by price)
P_V
M
G
A
P_w
P_s
B
S_o
D_1
D_o
Quantity
Q_s
Q_e
Q_d

Source: John Felmy, The Economic Efficiency Gains of Accelerated Natural Gas Price Decontrol - A Micro-Macro Linked Approach (ICF Incorporated, submitted to the U.S. Department of Energy, Office of Policy, Planning and Analysis, Division of Energy Deregulation, December, 1981) consumption lost would be given by ABGN. He calls this the maximum efficiency gain (we call it maximum curtailment inefficiency).

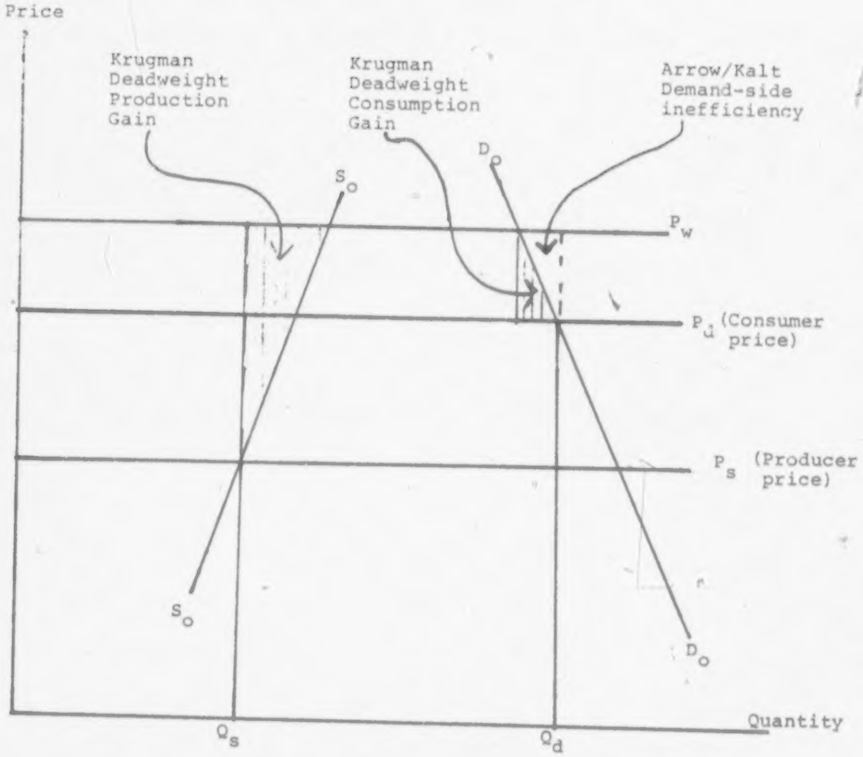
Rationing allocation inefficiency (and therefore the potential efficiency gains) would be the difference between the loss in output due to curtailments, if curtailments were allocated efficiently and the loss if they are not allocated efficiently. This is the area bounded by MBGN. This gain would be registered as an increase in consumer surplus. The area is determined by the shape and location of the demand curve of those who actually have access to gas.

Felmy does not make it absolutely clear that physical shortages must occur for these gains to be relevant, even though he does not make Loury's error of double counting gains.

4. Krugman: Additional Clarifications

Krugman, who follows Arrow/Kalt closely, makes changes in the conceptualizations that are useful (see Figure A.6). To begin with, he assumes that the domestic supply and demand curves do not cross. That is, the market does not clear in domestic energy sources. This concept was only implicit in the earlier analysis. Second, he introduces a difference between the price paid to suppliers (P_s) and the price which consumers see (P_d). This is applicable to the natural gas market. Third, he measures the Arrow/Kalt demand side inefficiency, which he calls the deadweight consumption loss, below the demand curve,

FIGURE A.6
KRUGMAN: REFINING ARROW/KALT


Price
Krugman Deadweight Production Gain
Krugman Deadweight Consumption Gain
Arrow/Kalt Demand-side inefficiency
S_o
D_o
P_w
P_d (Consumer price)
P_s (Producer price)
S_o
D_o
Quantity
Q_s
Q_d

Source: Paul Krugman, Real Exchange Rate Adjustment and The Welfare Effects of Oil Price Decontrol (MIT, Energy Laboratory, Discussion Paper No. 1, May 1981), p. 3.

rather than above it. This is conceptually preferable and mathematically very close to Arrow/Kalt.[5]

C. A Summary of Potential Efficiency Gains

On the basis of these conceptualizations, we can define seven different inefficiencies or potential efficiency gains (see Figure A.7). Let us briefly describe the market structure before we define the potential efficiency gains.

First, note that the market is typified by a ceiling price for producers (P_s) above the average price (P_d) that consumers see. This situation obtains in the natural gas market due to the partial decontrol of NGPA. Further, note that curtailments occur at Q_c. Inefficient administrative rationing occurs. The domestic supply ends at point H, where the import supply curve begins. To accommodate a market with both curtailments and imports, we assume that imports are oil and some consumers who can use only gas are denied access to it.

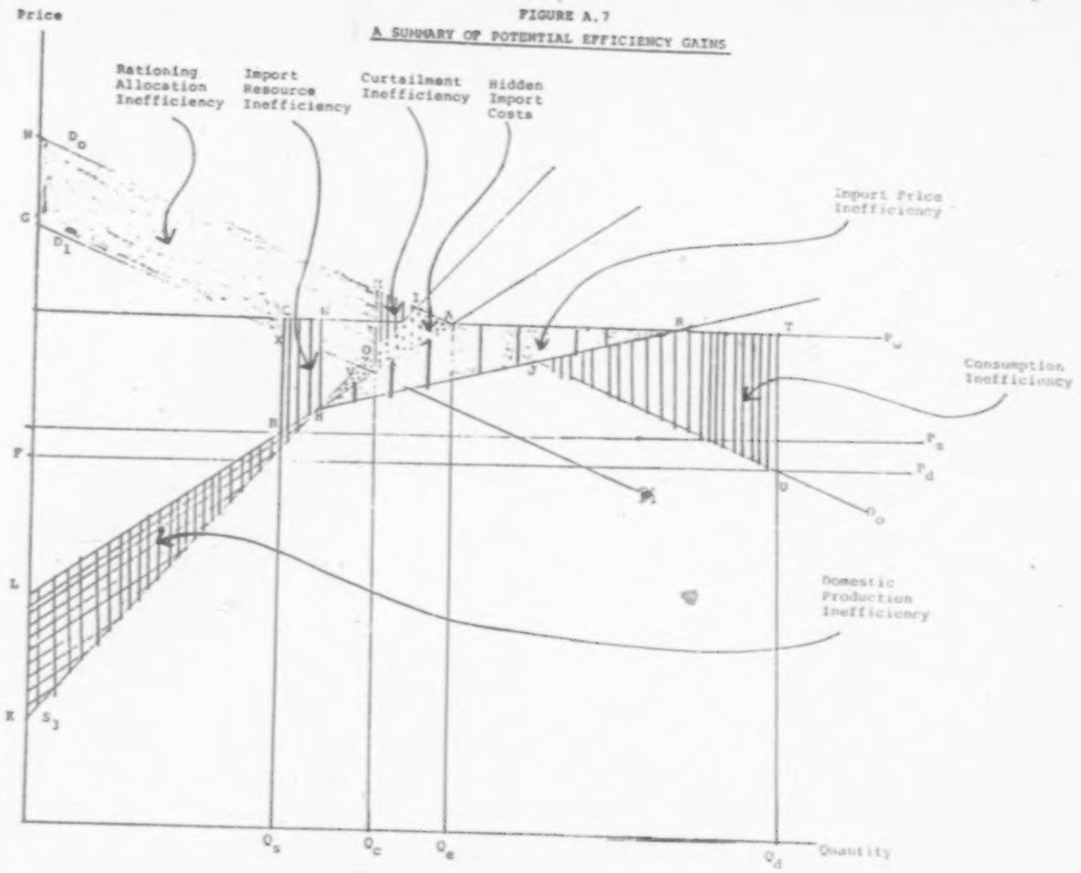
The inefficiencies and potential efficiency gains are defined as follows:

1. Rationing allocation inefficiency: Loss in value to the economy due to the fact that rationing provides gas to those who value it less, and denies gas to those who value it more (NMOVWCXG).

2. Import resource inefficiency: Resources spent on imported energy that could have been paid to domestic producers rather than foreign producers -- thereby increasing domestic producer surplus (WHBC).

FIGURE A.7

A SUMMARY OF POTENTIAL EFFICIENCY GAINS


Price
Rationing Allocation Inefficiency
Import Resource Inefficiency
Curtailment Inefficiency
Hidden Import Costs
Import Price Inefficiency
Consumption Inefficiency
Domestic Production Inefficiency
M
G
F
L
K
D_o
D_1
S_J
C
N
X
I
A
O
V
R
T
J
E
B
H
U
P_w
P_s
P_d
D_o
Q_s
Q_c
Q_e
Q_d
Quantity

3. Curtailment inefficiency: Loss of value due to the fact that some consumers are deprived of gas and therefore unable to undertake economic activity (MIO).

4. Hidden import costs: The value of imported energy not reflected in its price (IAH).

5. Import price inefficiency: Resources spent on imports whose price has been increased due to excess domestic demand and reduced domestic supply (ARH).

6. Consumption inefficiency: The difference between the price actually paid and the utility to the nation of the energy actually consumed (JRTU).

7. Domestic production inefficiency: Resources spent on domestic production as a result of directing production operations into less than the most economic (i.e., least cost) patterns (HKL).

In Figure A.7, for the purpose of labeling gains and measuring them, these inefficiencies are defined so that gains based on alterations in resource flows take precedence. That is, efficiencies which are savings against current imports or domestic expenditures are counted first. Price effects are given second precedence. That is, projected gains due to changes in price implicit in the supply curve are identified after changes in resources. Externalities are counted third. That is, the implicit costs of imports are identified third. Finally, "valuations" are counted last. That is, the gains due to the implicit value placed on consumption by society (implicit in the demand curve) are counted last.

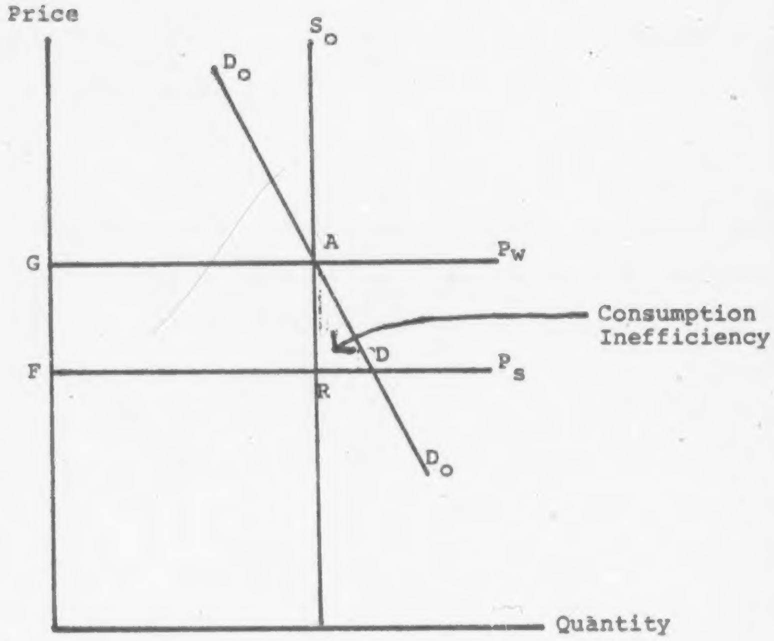
This approach is taken only because it seems to represent an ordering from the most to the least tangible effects. That is, where resources are already flowing, then it seems fairly likely that gains which rely on redirecting flows can be realized. Resources and price effects also seem to be the most easily observable and measurable. They are also much less sensitive to assumptions. Valuations are largely implicit.

Indeed, having carefully identified all of the potential efficiency gains of decontrol, it must be said that in general they are extremely sensitive to assumptions about the price elasticity of supply and demand. Above all, as the supply elasticitiy becomes small, all of the potential efficiency gains except the consumption gains approach zero (see Figure A.8). Under the assumption of very low supply price elasticity, there is very little gain from decontrol. Moreover, there are very large transfers of wealth within the domestic economy. That is, consumer surplus is reduced dramatically (the area bounded by ADFG) while efficiency is increased slightly (the area bounded by ADR).

As several other analyses conducted by CECA/RF have shown, the elasticity of supply in the gas market is extremely

FIGURE A.8

CECA's REPRESENTATION OF EFFICIENCY GAINS RESULTING FROM AN INELASTIC SUPPLY CURVE


Price
S_o
D_o
A
G
P_W
Consumption Inefficiency
D
F
P_s
R
D_o
Quantity

low so that efficiency gains are likely to be small.[6] The market looks more like Figure A.8 than A.7. In fact, in DOE's recent analysis, the total efficiency gains were only one-third as large as the loss in consumer surplus.

D. Efficiency Losses

However, let us assume that some quantity of real resources can be gained in the energy sector through decontrol. We next must ask what the cost of those gains will be in the non-energy sectors. That is, decontrol dramatically raises the cost of a critical input into the production process and it is certainly reasonable to ask whether or not such a change leads to losses in production efficiency.[7]

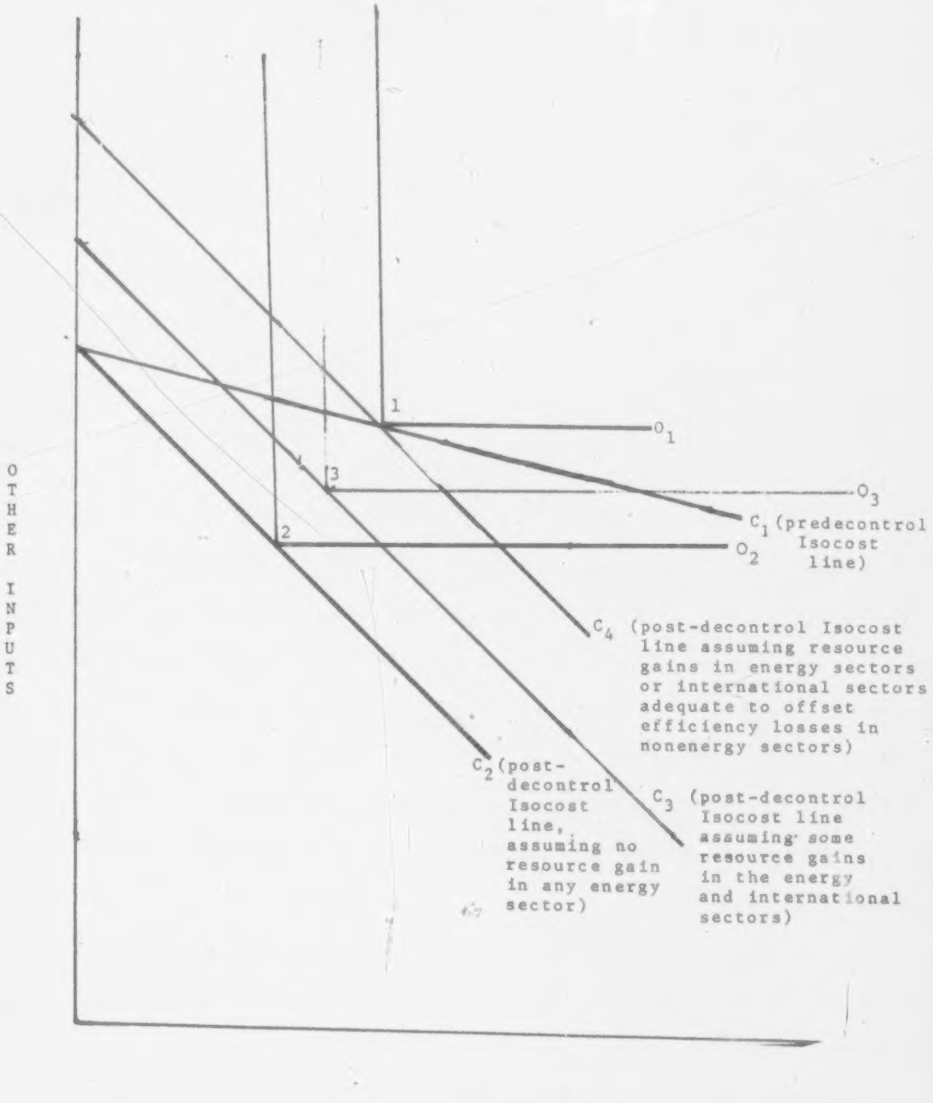
In fact, the empirical evidence suggests that in both the short and long term, there are losses in efficiency in the general economy. Conceputally, those losses in productivity and output can be explained with reference to a production function (see Figure A.9). If the elasticity of substitution between energy (gas) and other inputs is low, then a rise in prices forces the economy down to a lower level of output. Figure A.9 uses production functions with zero elasticities of substitution to make this point.[8]

Prior to decontrol, production is at point 1, on production function (isoquant) 0_1. An increase in gas prices shifts the isocost line from C_1 to C_2. That is, the price of gas increases relative to other inputs. Because there is no

FIGURE A.9

A REPRESENTATION OF EFFICIENCY LOSSES IN NONENERGY SECTORS

with Zero Elasticity of Substitution Between Energy and Other Inputs


1
O_1
3
O_3
C_1 (predecontrol Isocost line)
2
O_2
C_4 (post-decontrol Isocost line assuming resource gains in energy sectors or international sectors adequate to offset efficiency losses in nonenergy sectors)
C_2 (post-decontrol Isocost line, assuming no resource gain in any energy sector)
C_3 (post-decontrol Isocost line assuming some resource gains in the energy and international sectors)
OTHER INPUTS

capacity to substitute for gas, the maximum output achievable occurs at point 2 on the production function 0_2.

However, if real resources are gained through efficiency improvements in the energy sector, the isocost line would not only change in slope, it would shift up to C_3. Output would be maximized at point 3 on production function 0_3. It still would be below the original level of output. If, and only if, the gain in resources in the energy sector is large enough to move the isocost line to C_4, will there be no loss in output.[9]

Obviously, the assumption of a zero elasticitiy of substitution is extreme. However, it does serve to illustrate the point that the overall impact of decontrol is dependent on two empirical issues -- the magnitude of resource gains and the elasticity of substitution.

As the elasticity of substitution increases, fewer resource gains are necessary to offset lost output due to rising prices. However, the question of whether or not the bottom line efficiency outcome will be positive or negative remains an empirical question. That is, one must empirically estimate what the elasticity is and how large the output losses will be and compare these to the resource gains. There is no theoretically certain conclusion.

The available evidence suggests that the elasticity of substitution for natural gas in industrial use is quite low. A recent estimate based on detailed analysis of both time series and cross national data placed it in the neighborhood of .5.[10]

If that is the case, there would have to be very large efficiency resource gains in the energy sector as a result of decontrol to achieve an overall positive impact. However, as noted above, the available evidence on the elasticity of supplies of natural gas does not suggest that such large gains are possible. Thus, the empirical evidence suggests that, in the overall economy, there will be net losses, not gains.

E. A Final Note

The macroeconomic data examined in CECA/RF's studies of natural gas decontrol is consistent with this pessimistic interpretation of empirical reality. That is, all econometric models (except one) predict negative economic impacts persisting for at least a decade. In an earlier report, CECA/RF pointed out that all the econometric models (except one) suggest that the negative economic impacts will persist _ad infinitum_.[11]

The one exception to this general conclusion occurs in the Hudson/Jorgenson Dynamic General Equilibrium Model (DGEM). As has been discussed in an earlier study, that exception can be easily explained.[12]

In fact, the DGEM model predicts losses in productivity in the overall economy as a result of decontrol -- losses that are still in evidence 15 years down the road. In fact, the decline in consumer surplus is three times as large as the efficiency gains in the energy sector. In fact, the losses in GNP in the economy due to declining productivity associated with decontrol are larger than the efficiency gains in the energy sector. However, this one model offsets these direct losses in GNP by an income transfer mechanism that is built into its structure. Thereby, it produces a positive net GNP effect.

The model achieves this result by assuming no price-wage-price spiral and therefore translates all price increases for gas directly into losses in labor income and increases in the income of gas-related capital. Thus, there is a massive transfer of wealth from those with a high propensity to consume to those with a high propensity to invest. In this way, the model raises the aggregate rate of investment in the economy through decontrol. In the long run, the model predicts GNP increases rather than decreases (as the other models do) because of this change in the aggregate investment rate.

Thus, even in the DGEM model, energy price decontrol does not stand on its own merits as economic policy. The bottom line is negative. It appears positive only because the model assumes a change in the aggregate rate of investment.

However, if the objective is to raise the aggregate rate of investment, why approach it through energy price policy, which causes severe short term disruptions and long term productivity losses? There should be preferable, more direct approaches which avoid the disruptions while capturing the benefits.

Appendix B

COMPARING THE OIL AND GAS ANALYSES

1. Introduction

In this report we have reviewed two sets of econometric analyses of the impact of rising energy prices -- the oil and gas analyses. With one set being largely retrospective and the other prospective, a comparison between the two is extremely inviting. Unfortunately, a number of factors make such a comparison extremely complex.

2. Methodological Issues

a. Basic Adjustments

First, as in the text of this report, we must measure the impact on a standard basis -- e.g., impact per 100 percent increase -- if the comparison is to be meaningful. Second, as in the text, we must also adjust the gas analysis to a flat base case because the oil analyses are usually done with flat base cases. Even with these adjustments other complications arise.

b. The Consumption of Fuels

Petroleum constitutes a much larger percentage of our total energy consumption than natural gas -- 40 percent compared to 25 percent. Therefore, for a given percentage increase in price, the impact of the oil price increase on the economy will be larger. Simple arithmetic suggests that the impact would be 1.6 times as large (.4/.25 = 1.6). Thus, for a given percentage increase in both oil and gas, we would expect the oil price increase to have an impact that is 1.6 times as large. However, we have also noted that, in the industrial sector, the price elasticity of gas is smaller than the price elasticity of oil. Thus, we might expect natural gas price increases to pose more problems for the economy. Therefore, an adjustment factor of 1.6 may be too large. However, for purposes of comparison, i.e., in order to use the oil analyses to predict the impact of gas price increases, we divide the oil impact by 1.6 to adjust the analysis for the fact that we consume so much more of it.

c. Foreign Resource Flows

At the time of the oil price shock, about 40 percent of the petroleum we consumed was imported. Presently, only about 5 percent of natural gas is imported. Insofar as resources that are not paid to foreign producers recycle within the economy, enhance the balance of trade and strengthen the dollar, the impact of rising petroleum prices led by foreign oil price increases would have a greater impact on the economy. Output would be reduced more and unemployment would be increased more. However, inflation would be about the same.

If we assume that every dollar paid for imports is "lost" to the economy, simple arithmetic suggests that the impact of rising oil prices will be 1.6 times as large as the impact of rising gas prices (.95/.6 = 1.6). We use this as an adjustment factor. This will be an overestimate because not all of the economic benefits of the exported dollars are lost. That is, some do recycle through the economy.

d. Monetary and Fiscal Policy

As pointed out in the report, the oil analyses did not take into account the monetary and fiscal policy responses to decontrol. That is, they assumed only that energy prices had changed. They did not assume other policy changes. Since monetary and fiscal policy changes were instituted in response to rising energy prices, the base case used to judge the impact of oil prices is incorrect. The actual impact would have been different had neutral monetary and fiscal policy been pursued.

The rule of thumb that was noted above is that monetary and fiscal policies may have doubled the impact. That is, losses in GNP and increases in unemployment may have been rendered twice as large as they would have been if accommodative rather than restrictive policies had been chosen. Inflation, on the other hand, was probably reduced by restrictive policies. That is, against the proper base case -- with neutral (flat) monetary and fiscal policies -- the impacts of rising energy prices would have been smaller on output and unemployment, but larger on inflation.

For purposes of comparison, we assume that one-quarter of the impact of rising oil prices observed in the econometric analyses should have been attributed to other policies. That is, the oil analyses misestimate the impact of rising prices. They underestimate inflationary impacts and overestimate output and employment impacts.

3. Results

Table B.1 presents the comparison between the natural gas analyses and the oil analyses with all of the adjustments made. It can be seen that the results are reasonably close. The direction of the predicted impacts are the same and they tend to differ by no more than one third. As pointed out in the report, the adjusted oil impact estimates fall roughly within the range of the high and low estimates of the gas analyses. The estimates included in Table 10 in the report are derived as follows:

$$\text{Estimate from oil analyses} = \frac{\text{Adjusted Oil Estimate}}{\text{Adjusted Gas Estimate}} \times \text{Mean of Partial Decontrol}$$

Insofar as the retrospective analysis can be seen as more trustworthy than the prospective analyses, the fact that the two yield roughly equivalent results reconfirms our confidence in the predictions of the impact of gas price increases.

Table B.1

COMPARING THE ADJUSTED OIL AND GAS ANALYSES

	Difference from a Flat Base Case per 100 Percent Price Increases					
	Output (% Change)		Inflation (% Change)		Unemployment (% Change)	
GAS[a]						
Partial Deregulation						
Average	-1.35	- .4	2.7	.7	+ .5	+ .2
Adjusted	-1.67	-3.2	3.3	2.5	+ .6	+1.1
Full						
Average	-1.3	- .8	.2	.7	+ .5	+ .2
Adjusted	-1.6	-3.6	2.7	2.5	+ .6	+1.1
OIL[b]						
Mork & Hall	-3.8	na	5.4	na	+2.7	na
Eckstein/DRI	-5.6	-6.6	5.6	4.8	+3.4	+6.9
Thurman/Berner (MPS)	-2.9	-5.8	2.9	2.9	+1.5	+3.1
Average	-4.1	-5.8	4.0	3.9	+2.5	+5.0
Adjusted	-1.2	-1.7	2.0	2.0	.75	1.5

[a] From Tables 5-7.

[b] From Tables 2-4.

FOOTNOTES TO APPENDICES

[1] The studies included in this review are: Kenneth J. Arrow and Joseph P. Kalt, Petroleum Price Regulation: Should We Decontrol? (Washington, DC: American Enterprise Institute, 1979); Glenn C. Loury, An Analysis of the Efficiency and Inflationary Impact of the Decontrol of Natural Gas Prices (Washington, DC: Natural Gas Supply Association, April 1981); John C. Felmy, The Economic Efficiency Gains of Accelerated Natural Gas Price Decontrol; A Micro-Macro Linked Approach (ICF Incorporated, submitted to the U.S. Department of Energy, Office of Policy, Planning and Analysis, Division of Energy Deregulation, December 1981); Paul Krugman, Real Exchange Rate Adjustment and the Welfare Effects of Oil Price Decontrol (MIT Energy Laboratory, Discussion Paper No. 1, May 1981).

[2] Consumer Energy Council of America Research Foundation, Natural Gas Decontrol: A Case of Trickle Up Economics (Washington, DC, January 1982).

[3] Krugman, Real Exchange Rate, p. 4 and U.S. Department of Energy, Two Market Analysis of Natural Gas Decontrol (Washington, DC: Government Printing Office, November 1981) define producer surplus or producer gain as the area between the supply curve and the equilibrium price. This represents the difference between the cost of production and the price producers receive.

[4] Consumer surplus is a more familiar concept than producer surplus. It can be measured as the difference between the utility of consumption for consumers, implicit in the demand curve and the price paid (see Paul Samuleson, Economics, Eleventh Edition [New York: McGraw Hill, 1980], p. 412).

[5] It appears to be conceptually preferable since the deadweight consumption loss can be directly compared to the potential change in consumer surplus that would occur if the consumption loss were eliminated.

[6] CECA/RF, The Past as Prolgue I.

[7] The elasticity of substitution is the critical determinant of the real income reduction as outlined in the report. Thus, all of the sources cited in Section B above are relevant. A most interesting exercise which shows specifically the impact of different assumptions about the elasticity of substitution has been conducted by William W. Hogan and Alan S. Manne ("Energy-Economy Interactions: The Fable of the Elephant and the Rabbit?" in Robert S. Pindyck, ed., Advances in the Economics of Energy and Resources,

Volume 1: The Structure of Energy Markets [Connecticut: JAI, 1979]).

[8] If the elasticity of substitution is zero, then the demand elasticity would be zero as well. Obviously figures A.1-A.8 do not reflect demand elasticities of zero. The figures are intended to be illustrative and any empirical specification of the argument should certainly resolve this apparent inconsitency.

[9] Several of the secondary potential efficiency gains identified by Arrow/Kalt -- such as price shock protection, more appropriate stockpiling behavior, etc. -- can best be represented either as shifts in the isocost line or changes in the shape of the production isoquant. This is in addition to the direct impacts on the energy sector. (See, in addition, William W. Hogan, "Import Management and Oil Emergencies," in David A. Deese and Joseph S. Nye, Energy and Security [Cambridge: Ballinger, 1981]).

[10] Robert S. Pindyck, The Structure of World Energy Demand (Cambridge: MIT Press, 1979), p. 222.

[11] CECA/RF, Natural Gas Price Deregulation: A Case of Trickle Up Economics.

[12] Ibid.

Senator Jepsen. Thank you. Mr. MacAvoy, is Mr. Cooper's concept of economic rent valid?

Mr. MacAvoy. The concept, as I understand it, is one in which as prices increase due to increases of demand, additional supplies are forthcoming at higher costs, the existing supplies of gas already in the system being produced under old contracts, if allowed to go to the level of the higher cost supplies in clearing the market at a single price, will earn an additional net income above the cost of providing that old supply.

In the words of David Ricardo, these are scarcity rents. They aren't called monopoly profits because they can accrue to small farmers who have cheap production conditions as the price at the marginal farm increases.

These rents are the source of incentives for the exploration and development of further supplies. It's the scurrying and hustle for obtaining those rents that keeps the small, exploratory or wildcat company going in this country. If they fall behind, if the wildcatters fall behind, those rents go to landowners. The largest landowner in the world capturing economic rents is the Federal Government of the United States because those rents get capitalized in the offshore bidding prices for lease rights to large volume of gas. The second largest holder is the State government of Texas, and maybe the University of Texas is the third largest.

These organizations capture these rents when the exploration and development process fails to keep up with the incentive. The rents are essentially transfers from consumer groups who pay the higher uniform price. These transfers have equity implications, as Mr. Cooper clearly stated. What he didn't clearly state is what those equity implications were. Is a transfer from consumers to the Department of Interior inequitable? It pays off a pitifully small proportion of the $250 billion deficit we're now running.

Is the transfer from consumers that are industries or manufacturers inequitable? Is the transfer to large-scale, inner-city apartment houses where the typical rent is $500 a month inequitable?

I have no idea. And no one who has been working on this, and I've been working on natural gas since my graduate student days in the late 1950's and I know most of the people who are working on it, have the slightest notion of what the equity implications of price increases of natural gas are. And I will stand corrected if further questioning suggests that. These transfers have economic utility because they solve the scarcity problem. They're incentives for exploration and development, incentives that are pitifully poor at the present time. As I said, we're not replacing our supply and if you reduce them, we will not replace our supply even more.

How unfair they are remains a mystery, but it is very clear that it is far more unfair to have low equitable prices and the shortages that we had in the midwest in 1976, 1977, and 1978, shortages which were not solved in terms of policy implications by the NGPA, although they were transferred and replaced with a ratcheted price.

So we have to be realistic about what we're doing and I think at this time realism calls for a thorough examination of how poorly we have done in policies designed along the lines that Mr. Cooper proposes here, that he proposed in 1977 before the NGPA in 1978. Rather than letting him continue to try to find the nirvana of a regulatory structure that produces a competitive supply at every rate of output, we really ought to go back to the market and see if the market can possibly do better than that mess that we've had in recent years.

Senator **Jepsen**. Is economic rent in this context a valid concept?

Mr. **MacAvoy**. The concept of the transfer of income from consumers to producers, where those producers receive net income above the straight out production costs of providing the supply of copper, or whatever it may be, is correct. There is a valid economic concept of rent.

Senator **Jepsen**. Mr. Twilley, do you have any comment on that? Any time any other panel member wants to comment, please do.

Mr. **Twilley**. I don't have any comment on that, Mr. Chairman. From a practical point of view, I guess I'd have to be professorial on that. I look at economic rents as being the difference between the low cost gas, the old gas, and the market price as being that sum of money which was available to pay for the exploration of new gas.

Representative **Lungren**. Mr. Cooper, I'd like to follow up on that. Obviously, you have very different views from Mr. MacAvoy on this. And I guess it really comes down to your characterization of its as a concept of market protectors. And Mr. MacAvoy's interpretation or characterization of it as governmental arrogance. Now I'm flattered that you believe that because I was elected by the people of my district, and so were other Members, and the Members of the Senate were elected by the people of their particular States, that somehow we have the ability to divine what is a proper equity transfer.

But, frankly, I've been around here 5 years and worked on the Hill before that and I've really come to the conclusion that the best and the brightest aren't here. And you acknowledge that we made some major mistakes—thank goodness I can say the year before I got here—but nonetheless, the Congress made major mistakes in setting up this process. And while Mr. MacAvoy suggests that we ought to deregulate, it seems to me what you're saying is that we ought to reregulate, but just do a better job of it.

Where do we get this ability to make these decisions better than the workings of the market place?

Mr. **Cooper**. Let me say that I believe in perfect markets and I don't believe in perfect regulations.

Representative **Lungren**. I didn't say perfect.

Mr. **Cooper**. I think it's foolish to shoot for perfect regulations, just as it's foolish to believe that the world market is a functioning perfect market.

I was not a fan of NGPA and the changes I would bring in NGPA really are changes of structure. I am not trying to guess the market price. I'm only guessing the market price by letting NGPA finish its course. But what I am most interested in, after NGPA plays itself out, is that set of institutional arrangements which will insure, as best as possible, that people are out there looking for the least cost gas, that are going to break up a series of relationships between the wellhead and the burner tip that reduce the incentive to look for cheap gas, that are going to stop the practice of automatically passing through price increases. I am a consumer of the Columbia Transmission Pipeline System which is one of the most flagrant violators of what is a simple, prudent standard. The fact that people execute some take-or-pay clauses and not others, to my detriment, is unthinkable. I believe that there are straightforward regulatory approaches which will give me some protection from that.

Representative LUNGREN. On that, on the take-or-pay contract, you say that we ought to establish regulations so that they are set at levels that are appropriate. My question is how do you determine what's appropriate? We didn't do a very good job of forecasting what the market conditions were going to be. How are we going to do a better job of forecasting such that we, through regulation, can make sure, quote, unquote, that the take-or-pay contracts are set at levels that are appropriate?

Mr. COOPER. Well, I believe that, in the first instance, and in the bills before the Congress, just about everyone has picked a number. They picked a number for the short term or the long term. Everyone knows that the 1990's and 1995's are inappropriate.

In several of the bills, FERC is asked to conduct a study of how the take-or-pay clauses should be set. And that will involve a study of financial institutions and how they see where take or pay should be set.

But the problem is that if you believe, as we do, in an imbalance of bargaining power, then it is encumbent upon the Congress to ask itself, is that market perfect or imperfect and where we see major imperfections, to design regulation.

I think that is a responsibility of the Congress. I tried to lay this out in my prepared statement very carefully. It is a difference of perception and assumptions about the underlying nature of the system.

Representative LUNGREN. You also suggest that this is a very different market system than that which was involved when we were deregulating crude oil; is that correct?

Mr. COOPER. Oh, absolutely. I loved the reference to the deregulation of crude oil because I believe that crude oil is currently being transacted in the world at least three times its marginal cost of production.

Representative LUNGREN. Well, let me ask you a question.

Mr. COOPER. Deregulation was June 1979, at about $13 a barrel. Today, it's still $29 a barrel.

Representative LUNGREN. Did you support deregulation of petroleum?

Mr. COOPER. Absolutely not, we did not support it.

Representative LUNGREN. You think we made a mistake on that?

Mr. COOPER. I believe if you look at 11 million people out of work here, if you look at the tremendous economic costs imposed on this economy, I believe that you should go back and rethink it, yes.

Representative LUNGREN. Gasoline price at the pump is 13 cents lower today than it was 1 year ago.

Mr. COOPER. And it's 55 cents higher than it was in June 1979, when deregulation began.

Representative LUNGREN. Did you make any predictions at that time like the Senator from Ohio as to how we're going to have $2 a gallon gasoline?

Mr. **Cooper**. No, actually, I haven't. But I did make a prediction in April 1979, which said that the choice is whether or not to go into the deepest depression since the Great Depression. And frankly, if you look back over the last 3 years, I think that prediction is as good or better than anybody else's prediction.

Representative **Lungren**. I happen to come from a district that produces a lot of crude oil. But it's not the monopolistic capitalists who do that. It's the city and State that I represent, the State of California, the citizens of the city of Long Beach. We're the largest independent oil producer in California.

When we were regulated, there were wells shut down. It wasn't because they didn't want to make a dirty profit. We tried to make things equal. We had an entitlement program that tried to make everything fair. And the net result of it was that it was more expensive for Chevron, or Union, or anybody else to purchase it from the local where it was regulated than it was to purchase foreign. And ever since that, I've really had a very tough problem accepting the fact that we can do a better job in these very, very complicated areas.

We can't even figure out what the deficit is going to be. We're supposed to have some control over that. And we passed a tax increase last year, which I voted against, but we passed one because people said that it was necessary to bring the deficit down. And 2 weeks later, we come up with projections of deficits at $100 billion higher.

So, I don't know. We don't seem to do a very good job on that sort of thing.

Senator **Jepsen**. Mr. Cooper, I hear you say that you want pipelines, for the sake of the consumers, to purchase the cheaper gas.

Now do you mean that, aside from lower prices, there are no other things to consider about guaranteeing that there will be a long-term supply.

Mr. **Cooper**. I clearly recognize that supply is important. But what I would like to do, what we need to do is to break the link that exists through current contracts, to push the price of gas up. We all agree on the current contracts problem. But I believe that there are structural problems underlying the contracts that do not provide proper incentives for producing gas at reasonable prices. We see no reason to give away the economic rents of old gas and we see the need to address the structural problems which push prices above what they need to be to elicit supply responses.

Now some of those rents are being dissipated in very high cost supply, but an awful lot of those rents are being passed through to consumers. Pipelines have not, in fact, just frivolously dissipated those rents. We believe the consumers are benefiting from the control of old-gas prices. But we believe that consumers also need protection from the way new supplies are priced. What we need to create is a counterbalance to the market power of producers to simply run prices up. The way we believe you can discipline the market is by preventing some of the explicit perverse contract clauses that have come into existence, such as the cross-referencing of prices. We do not believe that the cross-referencing of prices makes any sense. It destroys the notion of competition. You talked about competition at the burner tip. But if the price of gas is indexed to the price of oil, there is no competition. For all intents and purposes, if you look at the current structure of contracts, everything is indexed to the price of No. 2, not No. 6.

We would like to see a set of institutional arrangements that create a counterpressure—a counterset of forces, market forces, if you will, but through a regulatory framework—that give pipelines and consumers power to balance producers.

Senator **Jepsen**. For the record, I'd like each member of the panel to please respond to this question: Can the natural gas market be made workably competitive as opposed to perfectly competitive?

Mr. **MacAvoy**. As perhaps you might start at the right, Senator, there are steps or sets of natural gas markets. At the field level there is a set of markets in which the purchasers are industrial consumers, local municipalities, and interstate of long-distance pipeline. There's a market at the wholesale consumption level in which pipelines provide supply in competition with other sources of energy and among each other. There's a retail market for gas in which the retail public utility provides supply to consumers who make choices on types of furnaces or stove systems.

With respect to the field level, there has been sufficient, I believe, and certainly significant research generated modestly from my doctoral disertation in 1960 through an interminable series of Government studies that essentially produce findings that there is workable competition in gas supply because of the ability of the pipeline systems to place one source of supply off against another in all conditions except during shortage conditions like those in the last half of the 1970's.

There, when there's a breakdown of the equilibrating process, there is not workable competition.

At the next level of the industry, above two-thirds of the consumers in the United States—that is, retail utilities as their agents, and industrial consumers in and around large cities—have two, three, even four, sources of supply. Maybe not enough to establish perfect competition. I'm not familiar with each transaction sufficient to say that it's workable competition in all cases. But certainly, as many sources of supply as you have available in the automobile industry, or in the steel industry, or the copper industry in this country.

The competition at retail is not sufficient to prevent the occurrence of systematic pricing above competitive levels in the absence of regulation. But no one I know proposes to deregulate the retail gas utility company and very few that I know propose to deregulate the pipeline.

What is at issue here is deregulation in the workably competitive field market for gas as an option to reregulating under the NGPA or continuing the NGPA through this process that now seems to produce such a price ratchet.

Mr. **Twilley**. Mr. Chairman, I agree in the retail level——

Senator **Jepsen**. Would you use the microphone, please.

Mr. **Twilley**. I'm sorry. In the retail level, I don't think in the foreseeable future it would be possible to deregulate gas. It's very difficult for me to comprehend an industrial user competing with a distribution company that is serving 100,000 residents for a given quantity of gas. I think that regulation has to be there in order to set priorities, for one thing.

Also, there are many different gas utility sizes. Some are very small and couldn't really compete for the purchase of gas in the producers' field. I think that regulatory bodies are necessary to see that the residential users, particularly, are protected and can receive a supply of gas.

I think at most all regulators would agree that there is very little hope, in our judgment, that there can be workable competition at this level.

The gas industry is a three-legged stool—the producers, the pipelines, and the distributing companies. The problem, as we see it, is the fact that deregulation of the producers must be accompanied by some kind of mechanism that will bring the producers and the ultimate purchasers together in a free market place. The mechanisms that have been presented so far, in our judgment, are probably not adequate.

What we can say in this area is that it has been a national policy to head in this direction. I think most regulators will say, well, we will go as far as we can and try to keep the mechanisms in place that help to make gas reasonably priced and we'll consider devices that will make workable competition possible. Contract carrier requirements for pipelines is one, perhaps, in the President's bill. And even in S. 823, we have the requirement that if a producer cannot—if some of his gas is backed out, that the pipeline will have to carry it at 5 cents per 1,000 cubic feet, plus costs.

These are little things leading toward the possibility of workable competition and we are willing, I think, as commissioners, to consider it. But we are very skeptical that this natural resource can possibly become totally deregulated in a workable, competitive market.

Mr. COOPER. I'd like to typify the market as one of weak market forces and strong political, or potentially strong political actors.

I have not advocated perpetual regulation through price ceilings. In that sense, there may be less difference between Mr. MacAvoy and myself than there appears. I believe that certainly at the pipeline level and the city-gate level we require regulation. What I want is not a series of categories, but a series of procedures and processes to elicit the right responses from pipelines. I would support some sort of contract carrier provisions so that those consumers who are big enough and have the access to get into the field can exert their market power.

But what we are talking about as for the wellhead, I'm aware of the history of the findings of workable competition at the wellhead. I'm not convinced of the criteria of those conditions. But I have not advocated perpetual regulation at the wellhead. What I've advocated is a series of institutions between the wellhead and the burner tip that will balance what I see as a maldistribution of market power between the people on this side of the wellhead and the people on the other side of the wellhead.

Mr. MACAVOY. Could I make a comment on Mr. Twilley's remarks, just in terms of providing a bit of perspective, gentlemen. NARUC, in its history, has had prime jurisdiction, primary jurisdiction, over the railroads and the trucks and the airlines within the State, as well as the electricity, gas, and telephone companies within State regulation.

My understanding of their positions before Congress through the last 25 years is that with respect to the railroads and the trucks and the airlines, and now the gas companies, NARUC never knows when to quit, that they're really in the regulating business. And it's fun to regulate right down to the last day to the last unit of output provided by the company that's destroyed by the regulatory process.

And I think NARUC here has given us essentially the same testimony they gave on the Railroad Reorganization Act of 1976 or maybe even the same they gave us on the Airline Act of 1938, that they're just not ready to quit.

Mr. TWILLEY. Mr. Chairman, we're right on this one.

Mr. MACAVOY. Why are you always wrong on the others, every time you appear?

Representative LUNGREN. Mr. MacAvoy, from your comments, it's obvious that you would rather us go to a deregulation mode as soon as possible. You criticize the administration's proposal for being in some ways confusing.

Do I take it from your testimony, however, that you do think that the administration's proposal is preferable to the present law?

Mr. MACAVOY. I can't really tell, Congressman, because it is impossible for me, with my limited resources, to determine the complex effect of the combinations of gas cap, renegotiation, and the elimination of incremental pricing—never mind the elimination of FUA and PURPA—in terms of the net impact that these conditions have on prices.

I have a fair idea from studying NGPA for the last 5 years that NGPA has a good shot at increasing prices about one-third and that if we were to eliminate both the vintage pricing provisions in NGPA and the take-or-pay/favored-nations clauses to essentially deregulate without all the bells and whistles of the administration act, that we can save 10 percent of that price increase, that the prices that would occur from that combination of straightforward, simple deregulation, now while there is excess supply in the market, will bring prices down 10 percent below what they would be under the NGPA as the NGPA works its way through in its own stately fashion.

So that deregulation will produce relative price decreases. They won't produce absolute price decreases, because demand is increasing too fast for that. But they'll produce relative price decreases.

The administration's bill, like the NGPA, is so darned complicated that I can't figure out what it will do.

Representative LUNGREN. Perhaps that's one of the ways that they think they could get it through.

Mr. MACAVOY. Well, it is a smokescreen. I agree. You lay down a smokescreen in front of the first four battleships and then you might be able to get around behind the Graf Spee and do some damage. I agree.

Representative LUNGREN. Mr. Cooper, you've grabbed the microphone. I assume you want to say something on that.

Mr. COOPER. I agree that the current contract structure is propping up certain prices. The critical question is how quickly you think the contracts on low cost old gas will be renegotiated under the administration plan, renegotiated upward, compared to how quickly you think the contracts on high cost gas will be renegotiated downward.

Frankly, having watched this market for the last 3 years struggle to resist tremendous downward pressures on price, one has to expect that you will get a much more rapid renegotiation upward on old gas prices than downward on new gas prices. The result will have to be large price increase rather than a price decrease. Again, that has to do with how you view the market. I look at who's out there, who's acting and who's not, what has been accomplished in the last 3 years as everyone began to recognize that the contract structure was unsupportable, and what has not.

Given the sort of political economic reality that I see, I think, under administration's bill we must experience an increase in price, simply because of the arithmetic of how renegotiations will take place.

Representative **Lungren**. Let me ask one question of the entire panel and this has to do with something that we were getting into a little while ago.

What is the legitimate way, in your individual views, of encouraging the wildcatter, encouraging the producer, of gas?

Mr. **MacAvoy**. There are two elements of discouragement. One is and has to do with ability to expect some constancy in contract terms. Since 1974, contract terms at the wellhead have changed so radically three or four times, first by opinion 699 of the Federal Power Commission; second, by the Natural Gas Policy Act; third now with these various proposals, certainly, that if one is in the business of supplying gas over a 20-year period, it is difficult, if not impossible, to have a clear, predictive grasp of what is going to happen under that contract.

Stability of terms that would reduce uncertainty can only be achieved by reducing the manipulation occurring in FERC or the Federal Power Commission and statute regulations.

The second element is within those conditions of high uncertainty, where is price likely to go in the middle and long term and can, on the basis of that price prediction, we expect to be able to generate scarcity rents sufficient to pay the cost of exploration and development?

My guess is, my judgment is that with respect to those conditions, under any one of these different proposals, we're not going to see very substantial differences in the level of exploration and development over the next 3 to 5 years, that the Cooper plan or Mr. Johnson's plan or my fresh deregulation will not produce very much change in exploratory activity because these are dominated by the uncertain conditions that I described first.

Mr. **Twilley**. If I may comment briefly on this, and I don't want to be sounding like I'm protecting producers. But I think that we have to recognize that take-or-pay contracts, long-term contracts, have been in this industry for a long time because when a well driller finds a well, he must have the security for the banks that lent him the money of a market for his well for a long period of time.

So it's been natural in this industry that these long-term contracts are created. And I think that the problem today is in reliance upon the Natural Gas Policy Act, which created the climate that made these high, take-or-pay contracts possible. It is that error that must now be legislatively corrected.

But most of the bills that are before Congress would not outlaw take-or-pay contracts. They are generally requiring that takes be reduced to some percentage of contracted amount or deliverability.

When we were considering S. 823, this issue was discussed broadly. In fact, it was the California commissioners who recommended the 50-percent cap or reduction because that would meet the foreseeable problems in California.

So in order to keep a climate for wildcat discovery, I don't think that long-term contracts are bad, or even that take-or-pay provisions are bad. It's only when they're excessive. And I think if we can bear that in mind as the present disruption gradually resolves itself, this danger may not continue with us much longer.

Senator **Jepsen**. I'm pleased to hear you say that. You know, one of the dangers in this I found out very early from experience with the folks who are concerned with this issue is that we generate a lot more heat than light.

The take-and-pay clauses are the normal procedure for doing business and have always been around. But we must be careful, too, about how they interact with regulation. As I have personally said many times that the 1978 Natural Gas Policy Act has been used by some in the private sector. They hide behind it so they can drag their feet in adjusting the contracts to reality. They don't need the Government to tell them that they've got a market-out clause or they've got to change to take and pay.

On the other hand, there are many pipeline contracts. And so when you say simply, go and get your contract changed, that's one thing. But to change 6,000 contracts with 900 suppliers, that doesn't happen overnight.

I have been advised that in this whole natural gas production-distribution system, there are about 30,000 contracts involved.

Mr. **Cooper**. I would point out that those contracts were, in fact, changed with tremendous rapidity after the act was written. And I'm talking about existing contracts on old gas.

Senator **Jepsen**. Excuse me. Say that again.

Mr. **Cooper**. I'm saying that existing contracts on old gas were reopened and renegotiated with tremendous speed to put in all of these clauses that we are so concerned about today. At least 30 percent, which is the number in the first study that I saw, and probably in excess of 50 percent.

And when I've asked people at the Energy Information Administration, who have been studying the contracts, why didn't you keep monitoring how many existing contracts were reopened on a regular basis, their answer was, these contracts are opened every day. That is, every time you spud a new well, you go in and you reopen these contracts.

The fascinating thing, and I have said this in public and I have said to Chairman Butler, the fascinating thing is that they only get renegotiated in one direction. Over 16 months ago I testified before the Senate Energy Committee and I said, there are downward pressures on prices. When Chairman Butler can come in and say that there's been a massive renegotiation to reduce take-or-pay clauses, we will see market forces operating.

In 16 months no ground has been given to take the very clauses out of contracts that got into those contracts almost instantaneously.

Senator **Jepsen**. When you ask representatives of the industry why—they'll say, that's because the Natural Gas Policy Act says it. We don't have any other choice.

Mr. **Cooper**. Well, the clauses that we're talking about were not part of the Natural Gas Policy Act. They were a function of, I believe, the bargaining power of two parties in a tight market. When the market turned around, and it's been slack now for quite some time, the bargaining power hasn't shifted. The pipelines cannot bring producers to take those clauses out and producers will talk about royalty owners and everything else. It's exactly that maldistribution of power that concerns me in the renegotiation process.

Mr. **MacAvoy**. Mr. Cooper is simply describing a situation, Senator, where you and I agree that I sell to you some No. 2 Red Winter at $2.80 forward 6 months from now. And when we get up to the 6-month time, it turns out that that is only $2.15 on the spot market in Chicago. Why should I renegotiate that contract with you? You and I entered into it in good faith. Unless we both agree that I should take a 75-cent loss, there will not be such renegotiations.

These are valid contracts, describing exactly the way, it can be described in exactly the way you did. They're between two parties and if the party has a take-or-pay clause in there that gives him 92 percent utilization when the system, as a whole, is on 65 percent utilization, he's going to enforce it.

What's at issue here is whether the take-or-pay clause would exist if we had an open and free market for these contracts. And I submit to you, humbly, that we didn't have take or pay with 92 percent or 95 percent before we had the NGPA. And it's been signed since the NGPA because the supplier comes in and says, OK, I have some 107 gas that goes at a price of $7. You have a whole set of contracts for 102 gas at $2. I want you to take my gas first because I know what you're going to do if you're a pipeline and demand goes down. You're going to take the cheap gas first.

So that the contract only occurs in that way because you have the vintage pricing. If everybody were paying the same price, everyone would have the same rate of take or pay. What we need in those clauses is a simple statute revision of the Natural Gas Act which says, take or pay clauses cannot be discriminatory.

It's as simple as that, which if you take from me and you take from the Congressmen, you take at the same rate.

Senator **Jepsen**. Good. I hear what you're saying.

Some of the regulations have gone too far. It's kind of like sticking your hand in a bucket of glue and then sticking it in a sack of feathers and then you try to shake the feathers off. To believe that regulation is going to solve all our problems is an approach that has not worked.

Reasonable people, with experience in the business world, look at it, they shake their head.

Thank you all—and I would ask, Congressman Lungren, do you have anything else? I'm going to ask for closing statements here.

Representative **Lungren**. No; I don't. Thank you, Mr. Chairman.

Senator **Jepsen**. I will also advise that the record will be kept open in the event that there are any members of the committee who have questions they'd like to submit, and I would appreciate it if you would respond.

At this time, if you have any closing statements, the Chair would be pleased to have them entered into the record.

Mr. MacAvoy. I would wish only to say, with due humility, that I support your last statement strongly.

Senator Jepsen. I'll have to remember it. [Laughter.]

Mr. Twilley.

Mr. Twilley. No, Mr. Chairman.

Mr. Cooper. I appreciate the opportunity and the committee's efforts to raise the level of this debate. As someone who is involved in the politics of it, I do appreciate and enjoy the opportunity to debate it at a somewhat different level than we're frequently used to around here. Thank you.

Senator Jepsen. Thank you, Mr. Cooper. I think that's a compliment.

Mr. Cooper. It was fully intended as a compliment. [Laughter.]

Senator Jepsen. Thank you, sir. The committee will now stand adjourned.

[Whereupon, at 12:35 p.m., the committee adjourned, subject to the call of the Chair.]

[The following information was subsequently supplied for the record:]

Congress of the United States
Joint Economic Committee
Hearings on Natural Gas Issues

NATURAL GAS POLICY: INTERNATIONAL ASPECTS

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The effect of the proposed natural gas legislation would be to unlock large amounts of gas, available at lower prices than current, from Canada and Mexico. The import of Alaskan gas, and of liquefied natural gas (LNG), which are clearly uneconomic, would no longer be considered, and should not be.

Push a balloon in one place, it pops out in another. Fixing natural gas prices below the market-clearing price generated excess demand. When some gas was exempted from regulation, the whole force of the excess was focussed upon the exempt supply, raising its price above the market-clearing price, which would prevail absent any controls.

The more severely we repressed the regulated gas price below the market-clearing price, the higher we forced up the price of exempted gas. This gave false signals to everyone, and generated massive waste of resources, by concentrating the search for gas into new and very expensive sources, instead of expanding supplies of gas from new deposits which happened to be located in "old" leases.

Matters were --and still are -- made much worse by pipelines "rolling in" old with new gas. The bigger the cushion of old gas, and the lower its price, the more extravagantly high the exempt gas price. Pipelines were and are ready to pay much higher prices for gas than any of their customers could be made to pay, because they can recoup those ultra-high prices they pay by raising the average price they charge to all their customers. The situation became much worse after 1978 because the second oil price explosion pulled up the prices of all substitutes for oil, including natural gas. Hence the rise in exempt gas prices, and the frenzied boom in deep gas drilling, which collapsed last year.

In recent years, price control has tended both to block gas supplies from Canada and Mexico, and to embitter relations with them. Our neighbors argued, and correctly, that their gas was just as good as the new or otherwise exempt gas, hence it ought to receive the same high price. They erred in not seeing that the ultra-high prices could only hold for a limited part of total gas supply, and only for a limited time.

The situation was already bad before 1979. A large proposed sale from Mexico was stopped because the price was higher than the regulated price, although lower than some unregulated ones. Had it been called off quietly, it would not have been so damaging. But it became a matter of high policy, and in effect though not in form, of government-to-government confrontation. It was made still worse by offensive insulting language used by some American officials.

In fact, our government was trying to discourage Mexican oil as well as gas imports, because too fast a buildup of those imports "would jeopardize carefully nurtured relations in the Middle East." (New York Times, November 30, 1978).

The same illusions were setting our policy then as now. "American strategists have always found a silver lining in the stable pro-Western Gulf that high oil prices helped to create." (New York Times, March 6, 1983.) True, high oil prices and billions in oil revenues have made the Persian Gulf what it is. "Stable" and "pro-Western"? I would rather look at the real world, of petroleum markets.

The second price explosion of 1979 made excess gas demand all the greater, because it made both industry and government think that oil and gas were becoming terribly scarce, and that prices must soar higher, forever and ever, or at least until 2000 A. D.

At home, oilmen clamored to borrow, and banks crowded to lend, on the basis of discounted-cash-flow projections of prices rising by 9 percent or more per year.

Mexico could commit to huge increases in spending, while expanding oil production at a moderate rate, putting gas development on the shelf.

In Canada also, the government banked on continuing steep increases. It bought out some foreign producing interests, at fancy prices, and forced out some by imposing sharing agreements upon them, because it expected the future value of those interests to be so much greater than the present value. In the same spirit, they decreased permissible exports of natural gas to the United States.

In this country, the obsession with scarcity led pipelines, with the encouragement of our government, not only to buy the extravagantly priced gas, but to sign extravagant take-or-pay clauses, which were in effect substitutes for still-higher prices.

The reaction began to appear in 1980. Canadian gas became difficult to sell even at permitted prices, because demand was dropping. In 1982, the demand for deep gas collapsed, and only those high inflexible take-or-pay contracts keep sizable amounts flowing, to the chagrin of the pipelines and the grievance of consumers. Deep gas that once fetched $9 or $10 is now selling at between $3.50 and $5.50 where permitted by re-negotiation or "market-out" clauses. Canadian gas, once held back because $4.94 was "too low", is now unsalable because it is obviously too high. Only about 40 percent of the Canadian allowable is actually exported.

The attempt to get gas export prices which are increasingly out of touch with reality has suppressed exploration and development of Canadian oil and especially gas, to their own injury and ours. Known reserves are lying fallow, and there is little or no exploration in areas with good prospects.

The current Canadian government cannot afford to admit that they have wasted the nation's resources, because the truth is too shaming to them. But there are already signs of change. Mr. Edge of the National Energy Board, said early in March that the price would have to come down. Some quavers are heard in the chorus about how the current U. S. surplus will become a shortage "again" in the mid-1980s. In time, it will be recognized that there never was any shortage in the United States, except the one created by price control.

The Canadian gas potential is very large, though I will refrain from guessing how many trillion cubic feet could be developed and produced. The fact is that nobody knows, that the only mechanism for finding it out is by allowing the Canadian industry to export, at a price which will move the gas. This would make it worth their while to develop the known deposits, which are considerable, and also to explore for those not yet known, which may be much larger. One transmission company has offered $3.45, and nobody doubts there is a great deal available at that price.

As for Mexico, proved reserves (excluding the dubious Chicontepec area) are being depleted at the rate of only 2 percent per year, and a sizable fraction of this is flared. Probable and potential reserves are much larger than proved, and the Mexican method of reserve estimation is conservative.

As Mexican oil production expands, as it must to restore foreign exchange receipts, more gas associated with oil will be produced also and be worth gathering and exporting. In addition, there are some promising discoveries of non-associated gas in the Northeast, not very far from the American border. Because Mexico is so close to the United States, gas can be shipped there relatively cheaply, and fuel oil used at home instead of being exported into today's glutted oil markets.

I hope we can refrain from pressuring Canada and Mexico to expand output or reduce prices in the name of hemispheric solidarity, or fair treatment of our consumers, or some such highfalutin reason. We will never win an argument couched in terms of right or wrong, and don't deserve to. In fact, negotiations are perfectly unnecessary.

The biggest favor we could do them--and us--would be to enact the proposed gas decontrol measure to bring all gas prices together at the market-clearing level. That would rapidly destroy the artificially low-priced gas which was responsible for the artificially high priced gas, which has been dazzling our neighbors' eyes.

The bill would immediately create a market in long term gas contracts. Sellers would seek out buyers, and vice versa. For the first time, producers could bargain directly with consumers, with one or more pipelines involved as carrier for a fee. There would be a wide range of alternatives for choice. All parties could come together to establish prices for sizable blocks of new supply. That is the crucial piece of information, which is always being generated in any market in long term assets, and which decades of regulation have destroyed in this country. Field price regulation has plunged everybody into ignorance. The regulation has grown increasingly complex and convoluted, to the point where nobody can say what is the price of gas today with which to compare the cost of new finding and development projects.

Today, the average field price paid for natural gas is around $2.75. How high would be the market-clearing field price of natural gas? The evidence is that it would be no higher and probably lower than what is current today for new gas, which is around $3.50. At this price, more gas is being offered than is being demanded. Recall that the gas surplus has persisted for several years, even before the onset of the recession in 1981. Apparently we are coming out of that recession, but few expect "smokestack industry" to revive quickly to where it used to be.

In the interim, if as we all hope it is that, we will have an opportunity to see how well domestic gas reserves respond to higher prices. In 1981, natural gas reserves-added exceeded consumption by 14 percent. Nobody knows whether this will happen again. If it does, field prices cannot rise. But let us suppose that reserves-added in this country will be insufficient to offset consumption at a price around $3.50. Large supplies can be developed in Canada and Mexico, at that price or less. If they would be willing to supply considerable amounts, the price cannot rise.

Canadian and Mexican supplies would compete in Texas, the West Coast, or the East Coast, treated no differently from any American producers. They would be reckoning with prices considerably lower than the last transactions they made, and they would have to decide whether to sell at that price, or at a lower price, or hold the gas in the ground.

Holding oil or gas in the ground is partly a fetish, and a tribute to prejudice. Canadian gas is too good for the Yanks, Mexican oil or gas too good for los gringos, just as American (Alaskan) oil is too good for the Japanese, Scottish oil too good for the English, still less the Continental Europeans, etc., etc. Holding mineral assets in the ground makes economic sense if --and only if -- the price is expected to rise at a rate faster than the rate of interest. Otherwise, the owner loses what he could have done in the interim with the proceeds, had he sold the mineral. We have it on venerable authority (Matthew 25:14) that if you cannot put assets to good use, lend them out in the money market, but don't leave them in the ground as did the "unprofitable servant", who did not deserve his trust. Delay has already cost sellers heavily.

Decontrol of gas field prices over a short period, during which the network of commitments to deliver and pay can be re-examined, would be a net gain to all three nations, because it would expand output of energy at a lower cost than available anywhere else. Gas from Canada and Mexico would be forthcoming in much larger amounts than in the past. There would be no more restriction of supply north or south of the border, in the vain hope of higher prices, but rather new export commitments, fed by new exploration and development creating larger reserves than exist now.

The panic which seizes on many consumers and Congress, to the effect that given decontrol all field prices will leap to $9, was not justified even a year ago, when such prices were actually being collected. It is completely delusive today.

Many people are sincerely afraid of a gas price "flyup", that given decontrol all field prices will leap to $9. The assumption is wrong, and the billions in additional payments are only a hash of meaningless arithmetic. Not only has the "flyup" already happened, it has overshot. If price controls were swept away, field prices on new gas contracts would be lower not higher, because new gas could no longer be rolled in with cheap old gas.

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At the consumer end, gas is going unsold today because the price is higher than what users are willing to pay, given alternative fuels. Thus without controls the prospect would be for some price decline. This excess has transmitted back to the field, where gas is likewise in surplus, more being offered than is demanded at top permitted prices, in the neighborhood of $3.50.

The cheap "old gas", which today generates so much acrid controversy, is a wasting asset. In ten years, it will be largely gone. If we perist in holding down field prices, we will have replaced it with new supplies priced at $7 and more from Algeria, a supplier which broke agreement after agreement with the French in the 1960s, and did the same thing to European and U. S. buyers of gas recently, stopping delivery "for technical reasons" until they obtained higher prices than in the contract. We will also have gas from Alaska costing $12 to $15, and more deep gas costing $9 or $10. That this will have been done in the name of protecting consumers from high prices makes a rather sour joke.

American Farm Bureau Federation

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April 15, 1983

Honorable Roger W. Jepsen
Chairman
Joint Economic Committee
Senate Dirksen G-01
Washington, DC 20510

RE: Natural Gas Legislation

Dear Senator Jepsen:

Farm Bureau is the nation's largest general farm organization, with over three million voluntary member families in 48 states and Puerto Rico. We estimate that about 85 percent of the working farmers and ranchers in the United States are Farm Bureau members.

Farm Bureau policy is developed from the grass roots up through the ranks of the organization. Because of the nature and scope of our policy process, we are confident that our adopted policies represent the thinking of a majority of individual farmers and ranchers in this country.

1983 Farm Bureau policy on energy, adopted in January at the 64th annual meeting, calls for deregulation of natural gas. This position is based upon the concerns of farmers and ranchers for adequate and timely supplies of energy necessary to produce, process and transport food and fiber for our nation. We believe that the market is the better allocator and price setter for all energy supplies, including natural gas.

The federal government has regulated natural gas since at least 1954. Federal controls kept natural gas prices artificially low. As a result, natural gas was overused in relation to alternative energy sources. Also, exploration and development of new natural gas supplies dwindled due to the lack of economic incentives. By the winter of 1976-1977, there was a severe shortage of natural gas, except in the unregulated intrastate markets of the producing states. Factories had to be shut down, schools closed, and many people were unable to heat their homes.

In response to this energy crisis, Congress debated decontrol, but finally chose to enact the Natural Gas Policy Act (NGPA). The NGPA gave rise to new problems and compounded the old ones. Regulations multiplied. Over twenty price categories were set favoring the most expensive gas to produce. The intrastate gas market was brought under federal control. New gas would eventually escape control, but old gas was to be forever regulated.

Today, in spite of an apparent abundance of gas supplies, prices are rising sharply. Consumers are angry and demanding relief. So Congress is again considering whether to deregulate or reregulate.

We submit that federal controls have not only failed, but have been the principal cause of supply and price problems for the consumer. Now is the time to completely decontrol all natural gas supplies. We believe that all consumers and every segment of our economy will benefit from decontrol.

Deregulation would have an impact on production agriculture primarily in the supply and prices of ammonia (nitrogen) fertilizer made from natural gas. The major uses of ammonia fertilizer are concentrated on corn, cotton, wheat, fruits, and vegetables. Ammonia fertilizer accounts for about 36 percent of fertilizer expenditures and about 2.4 percent of overall production costs. Approximately 40 percent of the cost of ammonia production is the cost of the natural gas input.

On a straight arithmetical basis, each 10 percent increase in natural gas prices would result in a 4.0 percent increase in the price of farm ammonia or a .1 percent increase in overall farm production costs. This means that even if natural gas prices doubled there would be only a 1 percent increase in farm costs. This assumes that gas price increases would flow straight through the production chain and that all else would remain the same. But all else would not remain the same. Ammonia producers would improve efficiencies. Farmers would accelerate the adjustments they are now making, such as using less ammonia, adopting more efficient methods of application, or switching to other nitrogen fertilizers.

We do not, however, foresee drastic price increases for natural gas under decontrol. We do foresee increased natural gas production and added competition among various energy sources, particularly petroleum based liquid fuels. This is very significant for production agriculture which spent $8.8 billion for gasoline, diesel fuel, and lubricants in 1982, more than one and one-half times the direct and indirect expenditures for natural gas. An abundance of natural gas not only places price pressures on liquid fuels, but also releases liquid fuel supplies for uses where there is no readily available alternative energy source, such as production agriculture.

Irrigation pumping and crop drying are the other major uses of natural gas in production agriculture that would be affected by deregulation. The use of natural gas for irrigation pumping takes place primarily in the states of Texas, Kansas, New Mexico and Arizona. Propane, derived from natural gas, has its highest usage in the states of Nebraska, Texas, Arkansas, New Mexico and Oklahoma. However, nationally 70 percent of irrigation pumping units rely on electricity, while only 19 percent use natural gas.

The use of natural gas for crop drying is highest in the corn belt. Usage varies considerably depending upon the weather which affects moisture content. Also, there already has been considerable interest by corn belt farmers in converting to low temperature natural air dryers and various solar applications for drying.

Overall, we believe the impact of natural gas deregulation would be minimal even under the worst-case projections for gas prices. Most farmers and ranchers can make compensating adjustments, and will do so better than they did when gasoline and diesel fuel prices skyrocketed under the OPEC embargoes. Assuming for the moment that the worst-case gas prices would occur, the increased supply advantages would still outweigh the price disadvantages. Furthermore, the present time is the best time to decontrol natural gas as far as agriculture is concerned. Tremendous commodity surpluses are dictating reductions in agricultural production, which means there will be reduced demands for natural gas based fertilizers. If decontrol were to occur now, natural gas price adjustments to market clearing levels would take place when agriculture's demands are lowest.

However, we do not believe worst-case price increases will result. If deregulation were to occur immediately, we believe overall gas prices would decline, particularly now that oil prices are dropping drastically. The present situation with petroleum is a good example of the benefits to be derived from deregulation of natural gas.

Numerous bills have been introduced in Congress which propose either reregulation or deregulation. We are opposed to those which call for reregulation through price rollbacks and freezes for all natural gas, both old and new. These measures would only compound today's problems and make the ultimate adjustment to marketplace determinations that much more difficult and injurious to consumers.

The Administration has proposed phased deregulation of all natural gas by January 1, 1986. Introduced in the Senate as S. 615 and as H.R. 1760 in the House, the Administration's proposal would encourage voluntary contract renegotiation during the transition period to correct current distortions in the regulated market. Consumers would be protected from further NGPA price distortions through price caps and Federal Energy Regulatory Commission reviews on cost pass-throughs above the rate of inflation. Take-or-pay obligations will be restricted to 70 percent, and parties to all pre-enactment contracts will have the right to market-out on January 1, 1985. The Administration's proposal also would repeal the Fuels Use Act of 1978 which restricts natural gas uses.

While we would prefer immediate, total decontrol, Farm Bureau can support passage of the Administration's proposal as contained in S. 615 and H.R. 1760. We recognize that there are refinements and improvements that can and will be made to the Administration's proposal.

However, we believe it is critical that there be no extension beyond the January 1, 1986, date for total decontrol, and that all gas--both old and new--be deregulated.

We reiterate that federal controls on natural gas have not only failed, but have been the principal cause of our supply and price problems. The last thing we need now is more of the same.

We will appreciate your consideration of our views in this matter of utmost importance. We request that our views be included in the Committee's hearing record on natural gas legislation.

Respectfully,

John Datt

John C. Datt
Secretary and Director
Washington Office

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cc: Committee Members

AMI
AMERICAN
MEAT
INSTITUTE
Serving The Meat Industry Since 1906

April 29, 1982

The Honorable Roger W. Jepsun
Chairman
Joint Economic Committee
Room SD-G01
United States Senate
Washington, D.C. 20510

Re: Natural Gas Legislation

Dear Chairman Jepsun:

This letter is intended to provide you, and the members of your Committee, with the views of the American Meat Institute (AMI) regarding legislation relevant to the regulation of natural gas. AMI is the oldest national trade association representing packers and processors of red meat. Although AMI's membership includes some of the nation's largest meat companies, more than 70% of the Institute's members employ 100 or fewer individuals. AMI's members are significant users of natural gas and, therefore, we are most interested in the way in which it is to be regulated.

The complexity of the issues involved in natural gas legislation and the multiplicity of proposals brought forward effectively limit AMI's ability to address each potential problem. Therefore, AMI's Energy Committee has concluded that comments reflecting the Association's general concerns in this area, rather than a detailed review of each aspect of each possible approach reflected in legislation already introduced and before the Committee, probably would be the most helpful imput which we can provide you.

AMI respectfully requests that these comments be included in that portion of the record of the Subcommittee's proceedings which you consider to be most appropriate.

The Meat Packing Industry and Its Use of Natural Gas

The red meat industry, SIC Codes 2011, 2013, consumes an estimated 100 trillion BTUs of energy per year in its facilities, according to various U.S. Department of Energy (DOE) studies. The 1982 AMI energy efficiency report to DOE indicated that natural gas presently represents 63.5 percent of all energy used by meat packing plants. Thus an estimate of natural gas use in the meat industry is about 64 billion cubic feet per year. Assuming natural gas prices at $4.00 per thousand cubic feet, this represents natural gas sales to meat packers totaling an estimated $250 million per year.

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The industry is comprised primarily of a very large number of relatively small sized plants throughout the country and is characterized by extreme competition and very tight profit margins (often less than one cent per dollar of sales). The natural gas bills for a meat plant (rarely larger than $500,000.00 per year) and the net profits of a meat plant frequently are of the same order of magnitude. Thus, any large or sudden changes in retail prices for natural gas will have an immediate, and potentially significant impact on a meat plant's profitability.

In the meat industry, natural gas is used for efficiency and economy in minor process needs for which there is no alternative to natural gas (except propane) such as hog singeing and in direct fired meat processing ovens.* However, an estimated 85 percent of the natural gas used by the meat industry is for boiler fuel where the normal alternative fuel is either No. 6 oil or No. 2 oil, or, in a few cases, coal, and in rare cases, even propane.

Typical larger plant strategy is to use natural gas for all fuel needs and to switch boilers, where possible, to installed alternate fuel oil use as soon as oil is cheaper. This has already happened in locations where No. 6 oil has become cheaper than the retail price for natural gas. Plants dependent on only No. 2 oil for standby boiler fuel still have alternative fuel costs well above even current natural gas rates. This strategy is not available to many smaller plants which are less capable of economically installing the capacity to consume an alternate boiler fuel. Moreover, throughout the industry, process gas needs will continue to be met with available natural gas, even when it greatly exceeds oil costs. Since there is essentially no profit market available to absorb higher fuel costs, higher natural gas prices will be reflected in resulting higher cost of meat to consumers.

Thus, while there exists significant elasticity of demand for higher cost natural gas if oil becomes cheaper, an increase in natural gas prices has a direct inflationary impact on meat prices.

In the mid-1970's, many meat packers dependent on interstate natural gas experienced severe curtailments of natural gas supplies. Interference with production occured where alternate fuel capability did not exist. Capital was spent on installing alternate fuel systems. Extended periods of curtailment required the use of expensive alternate fuels, often at prices over twice the cost of the natural gas curtailed.

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* The United States Department of Agriculture has not approved the use of fuel oil substitutes for natural gas (or propane) for use in these processes where the combustion by-products come in contact with human food.

The Natural Gas Policy Act of 1978 (NGPA) put natural gas on a road to price decontrol in order to assure adequate supplies. Since then, natural gas supply problems have virtually disappeared as an issue. The issue now is price.

Natural gas prices have escalated at rates above inflation and in excess of those anticipated under the NGPA decontrol scheme. Large price differences between regions of the country are now commonplace. Where natural gas has exceeded the cost of alternate fuels such as No. 6 oil, switching to oil has occurred and natural gas distributors are offering reduced rates to such users. The experience of the meat industry during a period in which its supplies of natural gas, i.e., prior to 1978, were curtailed, shows that the return to abundant supplies of natural gas since 1978 has saved the industry many millions of dollars per year in fuel costs.

Despite its flaws, enactment of the NGPA has resulted in a reversal of the problems of chronic natural gas shortages due to the interstate natural gas market. The pricing problems now experienced under the phased decontrol are several, summarized as follows:

(a) low cost older gas is not being produced in volumes expected, due to its remaining under controls;

(b) new gas, while undergoing phased deregulation, is still well below market value, and a price fly-up could occur when new gas is totally deregulated;

(c) deregulated gas is being sold at well above its true market value because pipelines can average all gas costs to their customers;

(d) regional price differences are becoming large because some pipelines enjoy a greater ratio of old to new gas;

(e) take-or-pay provisions of deregulated gas sources and import contracts are causing more expensive gas to be taken in lieu of controlled sources; and

(f) end-users of gas concerned about the large percentage increases in gas rates, now at 20 to 30 percent per year, feel such a rate of price climb is too high or too fast for the economy to absorb.

These serious pricing issues are precipitating requests for Congress to consider new legislation to refine the present course of decontrol of natural gas.

Principal Concerns of the Meat Industry With Respect to Legislation Regarding the Regulation of Natural Gas

As discussed above, the meat industry's composition, i.e., primarily small plants, dispersed throughout the country, and its low margin of profit result in its being highly vulnerable to gyrations in the market for natural gas. Despite the best efforts of legislators and regulators, the substitution of regulatory programs for the operation of historic market mechanisms has resulted in unsatisfactory distortions in the natural gas market, first in the area of supply and more currently in price. Thus, AMI believes that any additional legislation should have as its primary objective the achievement of a true "market" for natural gas, subject to the operation of historic market mechanism. However, AMI recognized that the achievement of that objective must be accomplished in a manner which does not inflict an unacceptable burden on the economy. Moreover, AMI recognizes that the extensive participation of the government in the natural gas market since the 1950's has shaped that market and created some obstacles to a smooth transition to an unregulated environment.

Absent affirmative action to eliminate the obstacles resulting from the government's intervention, the "deregulation" of natural gas would make little sense, since obstacles, such as long term contracts which do not provide both parties with the opportunity to adjust to changing market conditions would effectively inhibit the operation of historic market mechanisms. In short, the government's past involvement in the natural gas market has created more obstacles to the free operation of that market than just its current regulatory program. The elimination of these derivative impediments must be addressed prior to the elimination of the regulatory program itself.

A prime example of a "derivative" impediment to the free operation of market mechanisms is the so-called "contract problem," i.e., the existence of price-escalator clauses, most-favored-nation clauses, and take-or-pay clauses in most producer contracts. These lopsided provisions protect the producer to the detriment of end-users. A more balanced contract with increased protection to the end-users would leave all these provisions intact but add to them, for the period of phase-out of controls, a market-out clause. Thus, if a producer prices himself out of the market, he would be forced to renegotiate the gas price to a point where the natural gas could be marketed successfully. At the point in time that natural gas is completely decontrolled, the forced inclusion of market-out provisions would be eliminated.

AMI is also very concerned about certain perceptions of advantages of the contract carrier provision proposed. Past experience leads us to believe that it would not have all the advantages one might expect. One of our member's experience with the former "533 Program" in 1979 helped us understand the practical problems of buying producer gas and arranging to transport that gas when the volume needed is small. In retrospect, we felt it was not practical to expect small gas users to be successful in finding gas sources for themselves and then expect them to be successful in negotiating with the one or more interstate pipelines involved in the actual transport route and then negotiate with the local gas distribution company for final delivery.

Very large industrial gas users will probably be supportive of the contract carrier provision, but small industrial users, such as almost every meat packer, would not enjoy the same benefits. When small gas volumes are involved, neither producers nor pipelines would likely want to incur the administrative costs for such transactions.

We do not disagree with the inclusion of the contract carrier authorization. Instead, we merely want to be sure that its advocates understand that its benefits would flow primarily to very large industrial gas users only and that it would not serve as a practical means of providing "free market" priced gas to the much larger number of small industrial and commercial gas users.

With the foregoing as background, AMI hopes that the following comments on broad, general proposals will be helpful to you and other members of the Subcommittee:

(1) Immediate decontrol would trigger price-escalator clauses and most-favored-nation clauses of producer contracts with pipelines, and the take-or-pay provisions of many supply contracts. Such action likely would result in an immediate and significant increase in natural gas prices at the wellhead. These costs will be transmitted to distributors who will immediately pass through higher averaged costs to end-users by use of the purchased gas adjustment mechanism. End users whose natural gas price exceeds their available alternative fuel costs will cease to use natural gas and opt for the lower cost alternate fuel. Those users who have no alternate or have high cost alternate fuels will see a significant increase in their natural gas prices. State utility commissions unwilling to let the full impact of this increase affect residential users of natural gas may choose to freeze the retail natural gas price, forcing business users to absorb the sudden increase in natural gas rates. Industrial users who have left the natural gas system for cheaper alternate fuels may be given discounted natural gas rates by distributors who need the industrial load to help carry the fixed costs of distribution of natural gas.

From the view of a meat packer, two affects of immediate decontrol would be felt: (1) an immediate increase in boiler fuel cost relative to the alternate fuel price, with boiler fuel price stabilization at that point, and (2) a second and much higher price increase for process gas. Those with only No. 2 oil for a boiler fuel alternative would have such a sizeable increase that consideration would be given to installing No. 6 capability to reduce fuel costs. These higher operating costs cannot be absorbed and, thus, would be reflected in price increases in the products. However, the degree of impact will vary regionally causing some packers more economic stress than others.

Natural gas supplies would remain plentiful, but costly with a two-tier price likely for natural gas depending on use -- one for boiler use, and another higher price for non-boiler use. Long-term supplies of natural gas would be expected to be excellent and, eventually, regional differences in natural gas price would likely lessen. Energy conservation would become even more important and waste heat recovery would be absolutely essential for energy cost control.

In summary, the scenario described above would cause immediate and serious economic disruption temporarily but, in the long-run, these problems would wane. Meat prices will have been forced upward as a direct result and, regionally, some packers will likely be more severely affected as compared to others. Packers less capable of implementing cost-effective state-of-the-art energy conservation measures would tend to lose in their relative competitive positions.

(2) Accelerated decontrol of new gas would have the same type of impact as described above for the immediate decontrol scenario, but in a much more muted fashion. Supplies of natural gas would remain as good as today, but higher natural gas costs will be felt which would be regionally different. Higher meat prices would result from a fundamental income transfer from the public to the natural gas producer. Accelerated decontrol merely hastens the transition period to the time of full decontrol which adds further economic stress at a time such stress may not be in the National interest. From a packer's viewpoint, costs would increase with very little compelling justification such as an improvement in natural gas supply assurance.

(3) Phased decontrol of old gas, however, would tend to increase the availability of this very low cost source of natural gas to pipelines to help them lower the average of all wellhead natural gas purchases. If phased properly, the net economic impact to packers would be minimal. If decontrolled too quickly, the economic impact would be negative, resulting in unneeded income transfer from the public to owners of old gas sources.

(4) Retaining the NGPA decontrol plan would continue the present environment of ample natural gas supplies and steadily increasing natural gas rates like those of the past few years and continuing regional differences in natural gas costs until 1985, when new gas is decontrolled or reconsidered for extended controls. At that time, no one knows if a price fly-up will or will not occur, but some sudden readjustments in prices is very likely. The more serious problem with no change in the NGPA is the continued full control of old gas causing less than optimal production of this economical source of natural gas.

(5) Extending controls beyond NGPA. If Congress were to extend controls on new gas and keep controls on old gas, the present problems in natural gas pricing would be prolonged. The extended short-term projection would be dampened price increases, while easing economic stress, would continue the present problems of marketing natural gas,

and would provide strong disincentives to needed production. Meat packers would see continued pricing problems regionally and could experience an increasing level of curtailment.

(6) A price freezing would fix, in time, the present pricing problems in natural gas without a solution and, at the same time, provide a strong disincentive for needed production. Ironically, natural gas prices to a packer would still increase even under the freeze due to inflation increasing the transmission and distribution costs and, in the long-term, increased curtailments would be assured.

(7) Continue the NGPA decontrol plan, but pass legislation to initiate phased decontrol of gas. Assuming a resolution of the "contracts problem," this scenario attempts to strike the best compromise between achieving decontrol in the long-run and minimizing economic stress in the short-run. The new legislation addressing decontrol of old gas would allow producers of this very economical and available source of natural gas the proper incentive to continue and promote production. The benefits to the end-user packers would be two-fold: (1) it would further improve natural gas supply, and (2) the more economically produced old gas would act to dampen the need to buy the new and higher priced natural gas sources. While natural gas prices to end-users would be unlikely to drop as a result, the increased production of old gas would help stabilize overall natural gas prices and lead to less differences in regional natural gas prices.

Should old gas decontrol be mandated, the inclusion of a windfall profits tax would be counterproductive. Such a tax would remove the very incentives to production intended by phasing out controls on old gas.

Finally, packers are best served by insuring that retail natural gas pricing reflects cost-of-service based on ratemaking for all users. Attempts to load the price of decontrol onto any one user group should be strenuously opposed. Repeal of incremental pricing would be consistent with this support for fairness in rates to all users.

AMI appreciates this opportunity to share its views with you. If you or your staff have any questions regarding AMI's comments, or if we might provide further information upon which our position is based, please do not hesitate to contact us.

Sincerely,

C. Manly Molpus

C. Manly Molpus
President

CMM/lwc